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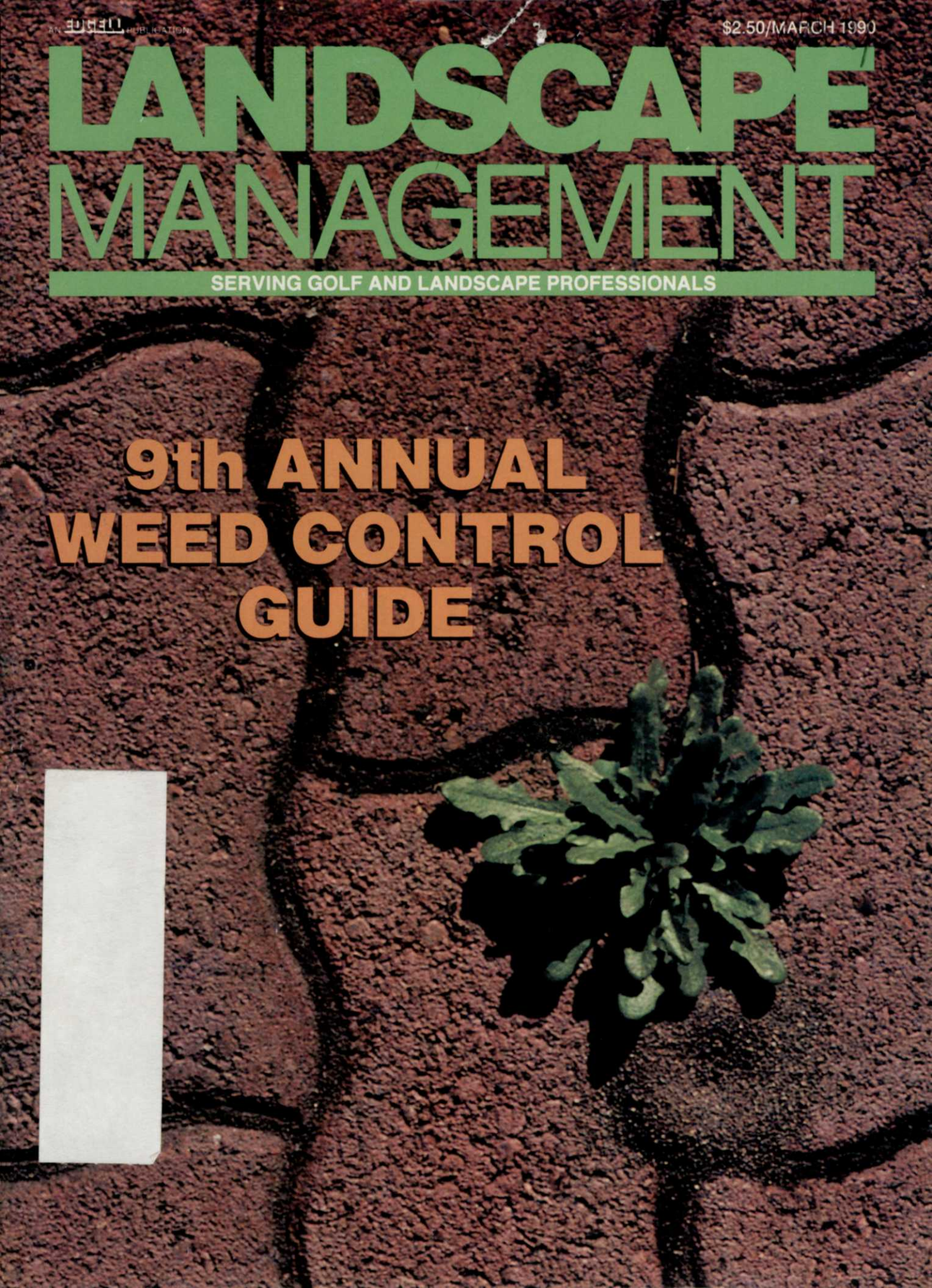

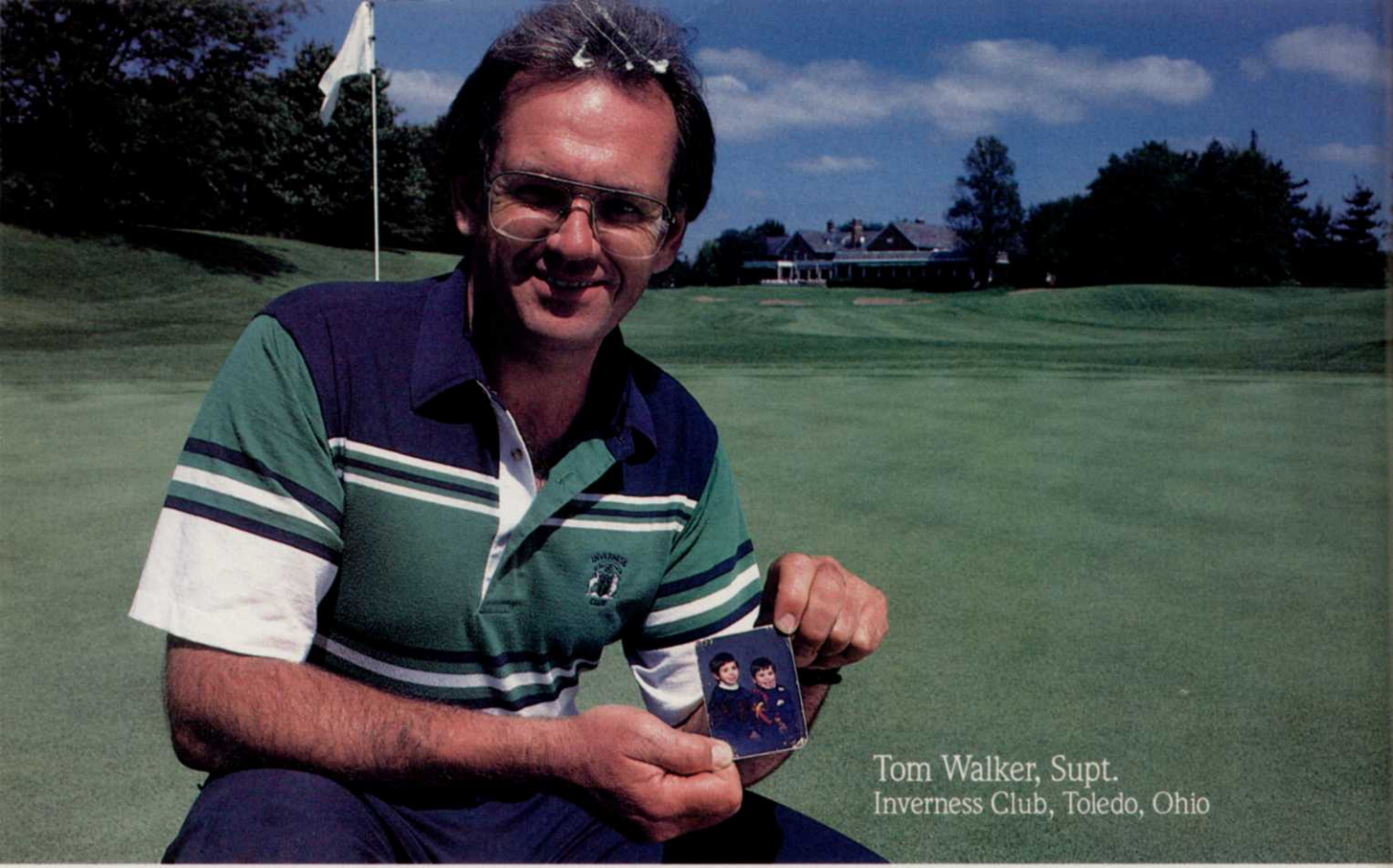


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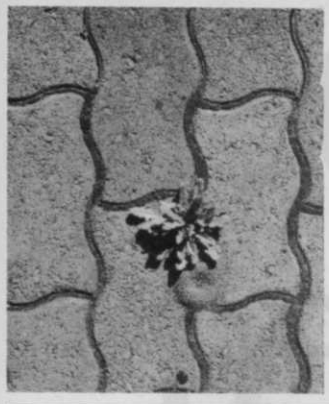
MARCH 1990, VOLUME 29, NUMBER 3

# LANDSCAPE MANAGEMENT

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# AS I SEE IT...

## The facts are on our side

Nary a turf conference goes by where attendees aren't warned that Joe Public sees them and their pesticides as part of today's environmental problem. In Indianapolis recently it was Steve Hardymon's presentation, *National Pesticide Legislative Issues*, that sounded the alarm.

Dr. Hardymon pointed out that protecting the environment and fear of pesticide contamination top American's list of concerns in the post-Reagan years—ahead of substance abuse, our failing public education system and AIDS. Pretty strong stuff.

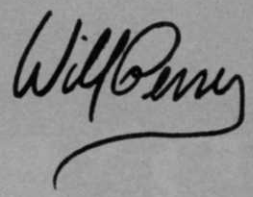
Dr. Hardymon's statistics were startling, but it was a six-year-old girl who really spelled it out for me.

One day last fall I watched my niece as she happily came running across my in-law's lawn in anticipation of one of those big hello hugs she seems to live for. About halfway across the lawn, however, she noticed the "post" marker from the local lawn care company and immediately beelined back to the porch. There, she stared at her little shoes with a look of confusion and horror, as if expecting her feet to melt before her eyes.

That vision of her, coupled with Dr. Hardymon's speech, shed light on how volatile the situation is today. The question is, what do we do about it? How do we become proactive? How do we defuse such a politically popular topic or respond to network advocacy?

Dr. Rick L. Brandenburg of North Carolina State University has a few answers in his article *When Chemophobia Strikes* (page 66). Dr. Brandenberg says that the battle must be waged one customer at a time, using professionalism, education and judicious pesticide use as our weapons. "Let the homeowner decide based on facts, not emotion," concludes Brandenburg.

I walked with my niece over the lawn and explained to her that the sign meant men had come and put down food for the grass and a spray to keep bugs away, that's all. "Oh," she said with surprise. "That's all?"



**Will Perry, managing editor**

# LM


### EDITORIAL STAFF

**Jerry Roche,** Executive Editor
**Will Perry,** Managing Editor
**Terry McIver,** Associate Editor
*Office: 7500 Old Oak Blvd.*
*Cleveland, OH 44130*
*(216) 243-8100*
*FAX (216) 826-2832*

### MARKETING STAFF

**Dick Gore,** Publisher
*Office: 3475 Lenox Rd. N.E.*
*Suite 665*
*Atlanta, GA 30326*
*(404) 233-1817*
*FAX (404) 261-7022*

**Jon Miducki,** National Sales Manager
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*Office: 7500 Old Oak Blvd.*
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*(216) 243-8100*
*FAX (216) 826-2832*

**Robert Mierow,** W. Coast Representative
*Office: 1515 NW 51st Street*
*Seattle, WA 98107*
*(206) 783-0549*
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**Tom Greney,** Senior Vice-President
*Office: 111 East Wacker Drive*
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*(312) 938-2317*
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*Office: 120 West Second St.*
*Duluth, MN 55802*
*(218) 723-9200*
*FAX (218) 723-9223*

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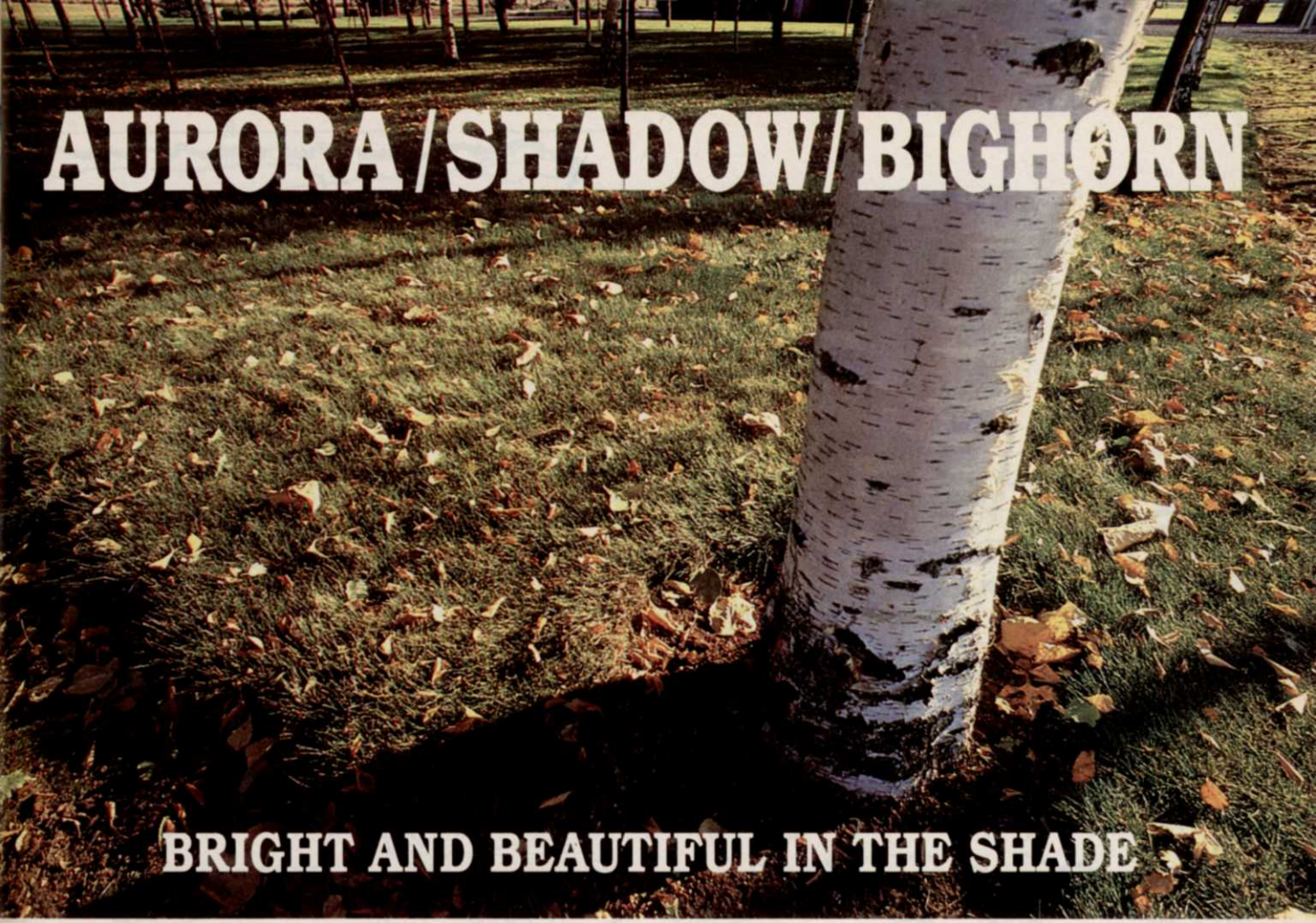


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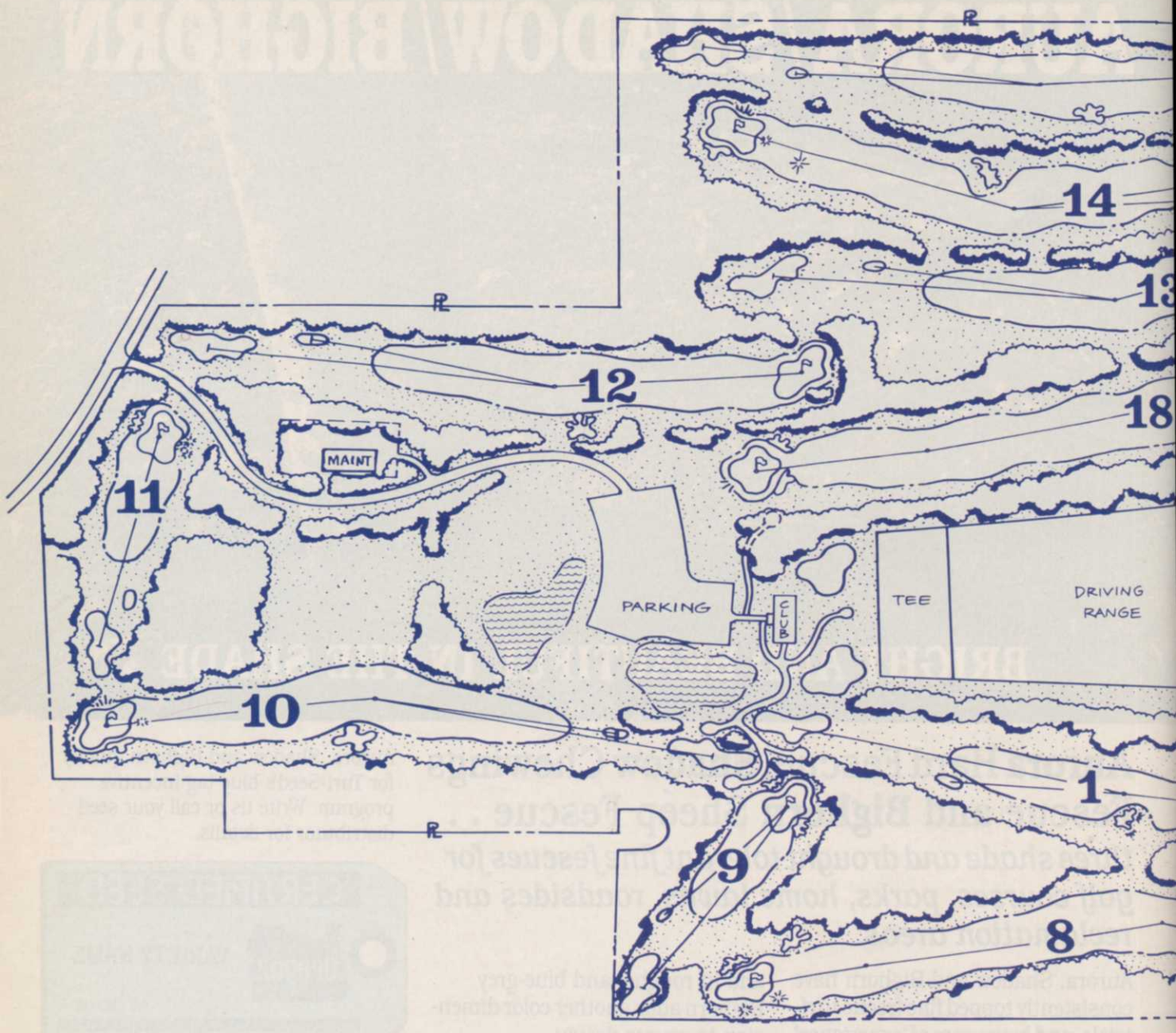


# You've designed the ultimate floor

Compared to all the work that goes into building a golf course these days, choosing the seed and fertilizer is simple.

You simply choose the proven, the failsafe, the best. Scotts® HD Starter® Fertilizer and PennPals* bentgrass seed.

HD (for high density) Starter Fertilizer gives new seedlings everything they need, except sunshine and water. It provides controlled-release nitrogen in proper balance with readily-available phosphorus and potassium to promote vigorous seedling growth and root development. And its homogenous, free flowing, high density particles provide even distribution of required nutrients.

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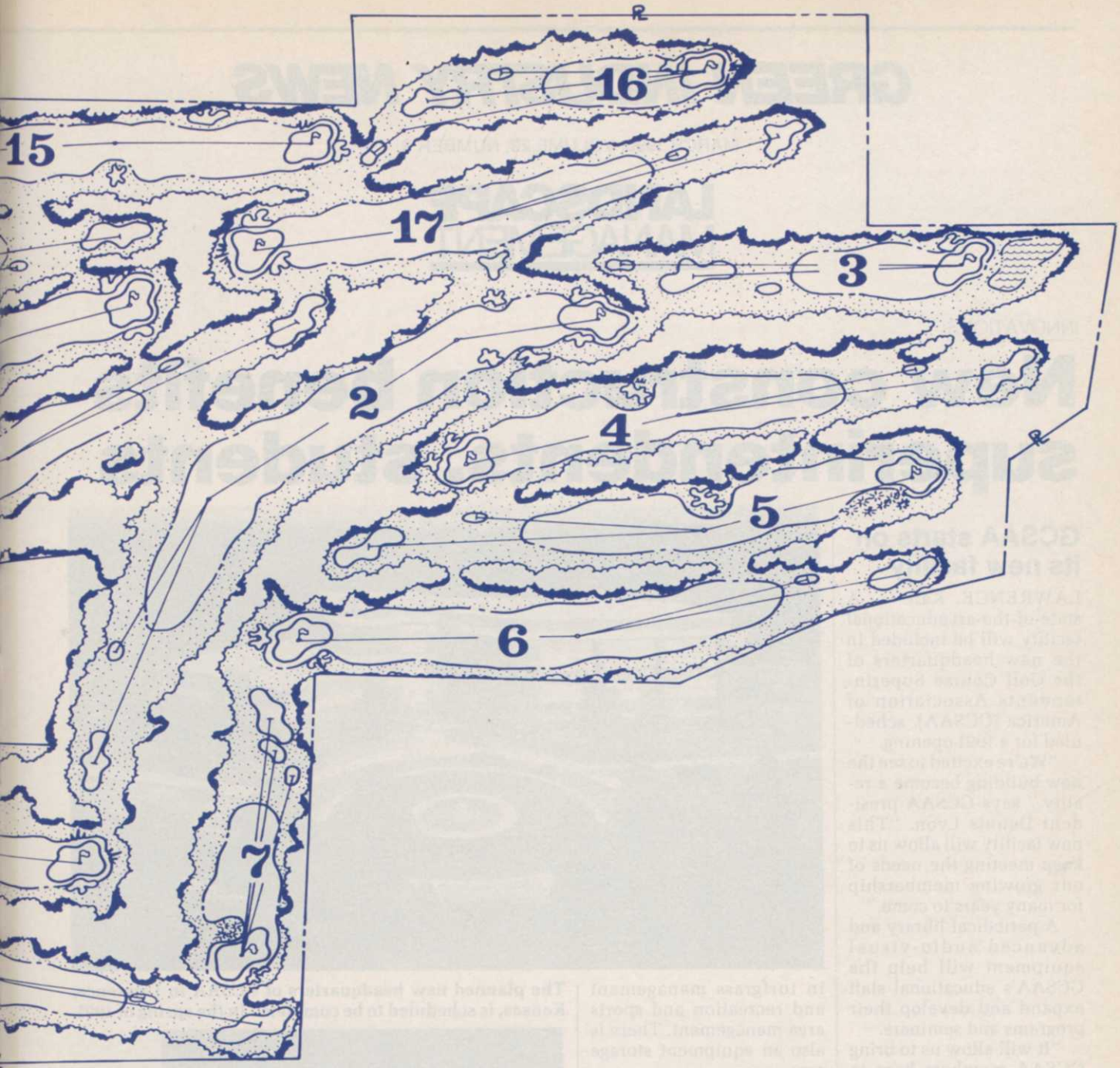


# plan. Don't skimp on the carpeting.

But, of course, no matter what fertilizer you use, you have to start with the best seed. Penncross, Oregon Blue Tag Certified Seed, is the standard of the industry. For thirty-five years it's proven itself through heat, drought, snow and flood as the premium surface for greens, tees and fairways.

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GREEN INDUSTRY NEWS

MARCH 1990, VOLUME 29, NUMBER 3

LANDSCAPE MANAGEMENT

INNOVATIONS

# New construction benefits superintendents, students

## GCSAA starts on its new facility

LAWRENCE, Kan. — A state-of-the-art educational facility will be included in the new headquarters of the Golf Course Superintendents Association of America (GCSAA), scheduled for a 1991 opening.

"We're excited to see the new building become a reality," says GCSAA president Dennis Lyon. "This new facility will allow us to keep meeting the needs of our growing membership for many years to come."

A periodical library and advanced audio-visual equipment will help the GCSAA's educational staff expand and develop their programs and seminars.

"It will allow us to bring GCSAA members here to Lawrence to attend educational activities in a facility that is custom-designed to meet our instructional needs," says director of education Colleen Smalter Pederson. □

**The planned new headquarters of GCSAA in Lawrence, Kansas, is scheduled to be completed in the spring of 1991.**

## New classroom honors Smalley

COBLESKILL, N.Y. — A new turfgrass building in honor of Dr. Ralph Smalley was dedicated recently at the State University of New York (SUNY) here.

The 24-by-80-foot wood and concrete structure contains insulated and heated classroom space for courses in turfgrass management and recreation and sports area management. There is also an equipment storage area.

Dr. Smalley, plant science professor emeritus, began SUNY Cobleskill's turfgrass curriculum in 1962. He received the State University Chancellor's Award for excellence in teaching in 1981.

The New York State Turfgrass Association contributed $26,000 of the $35,000 total cost, and also donated an IBM Model 30 computer, printer and monitor to the turf program. A matching funds grant of $5,500 was awarded by SUNY Research Foundation. ChemLawn Corp. donated $2,500 and Stanford Seed Co. $700. □

**Dr. Ralph Smalley (left) at the dedication ceremony of SUNY Cobleskill's turfgrass building. Dr. Bob Emmons holds a plaque awarded to NYSTA for monetary support.**

GOLF

# Mastodon skeleton unearthed in Ohio

NEWARK, Ohio — A mastodon skeleton dating to the Pleistocene epoch was unearthed in December from a peat bog at Burning Tree Golf Course here.

The bones are in excellent condition, and are estimated to be between 10,000 to 12,000 years old.

Sherm Byers, owner of the course, says drag line operator Phil Flowers, of Phil Flowers Construction Co., discovered the prehistoric pachyderm skeleton while clearing the bog to make way for a nine-hole addition.

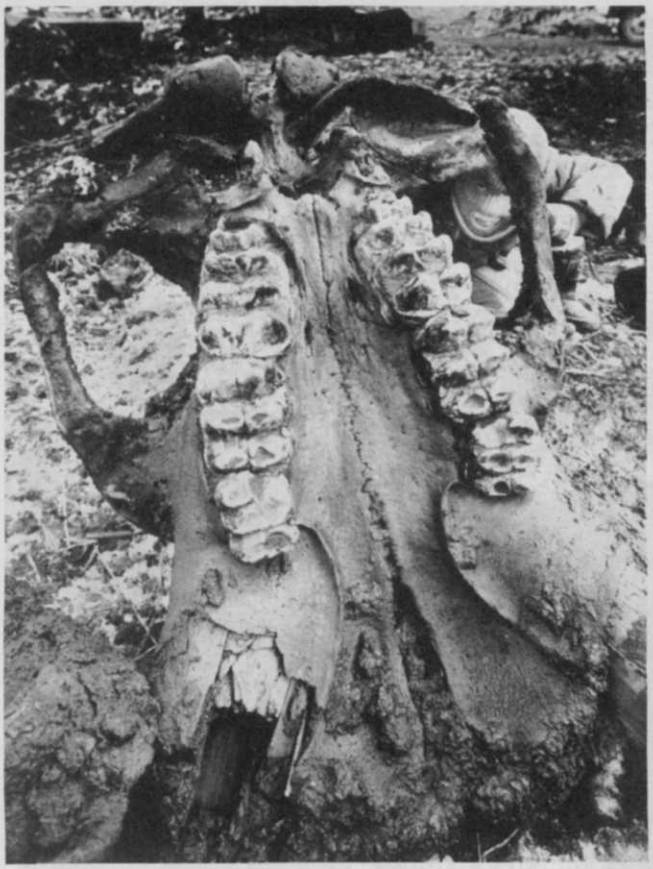
"There is no doubt in my mind we have a complete mastodon," proclaims Byers. Paul Hooge, director of the Licking County Archeological and Landmarks Society, agrees that the remains seemed to be complete. Hooge supplied direction and expertise during the excavation.

Mastodons were elephant-like creatures that grew to over nine feet tall. They became extinct about 8,000 years ago. Experts say mastodon remains are not uncommon throughout the Midwest.

The bones discovered were of a young female mastodon, and were well-preserved thanks to the acidic peat. Workers used a power shovel to scrape away the cover of the bog and picked through the peat with hands and shovels. Tusks, ribs, skull, upper and lower jaws, shoulder blades and pelvic bones were among the items unearthed.

No golf clubs were found near the remains.

At press time, plans were being discussed to build a museum on the site to house the remains. □



**This mastodon skull dwarfs a small boy (upper right) who was watching while workers unearthed its remains. (Photo by Tim Revell, courtesy of the *Columbus Dispatch*.)**

SOD

# ASPA urges 'Earth Day 1990' activities

ROLLING MEADOWS, Ill. — The American Sod Producers Association is urging its members to participate in local "Earth Day 1990" activities on April 22, calling the campaign "a great way to show off turf."

Earth Day is a nationwide celebration designed to raise awareness of the environment.

The ASPA suggests its members consider hosting an open house at their "fresh air factories," also known as turfgrass sod farms. By using scientific information presented by the ASPA, farms could set up signs showing how a 50-by-50-foot area releases oxygen for a family of four; how turf helps clean water; or how safe turf is by demonstrating the egg drop test.

Schools, garden clubs, landscape architects and contractors are just a few of the potential groups that could be invited to the demonstrations, in addition to media representatives, says ASPA.

To learn more about the event and local contacts, please write Earth Day 1990, P.O. Box AA, Stanford University, CA 94305. □

TURF

# Annual bluegrass is here to stay, notes Michigan turf panel

**DowElanco's Dr. Tom Perkins: accept *Poa annua*.**

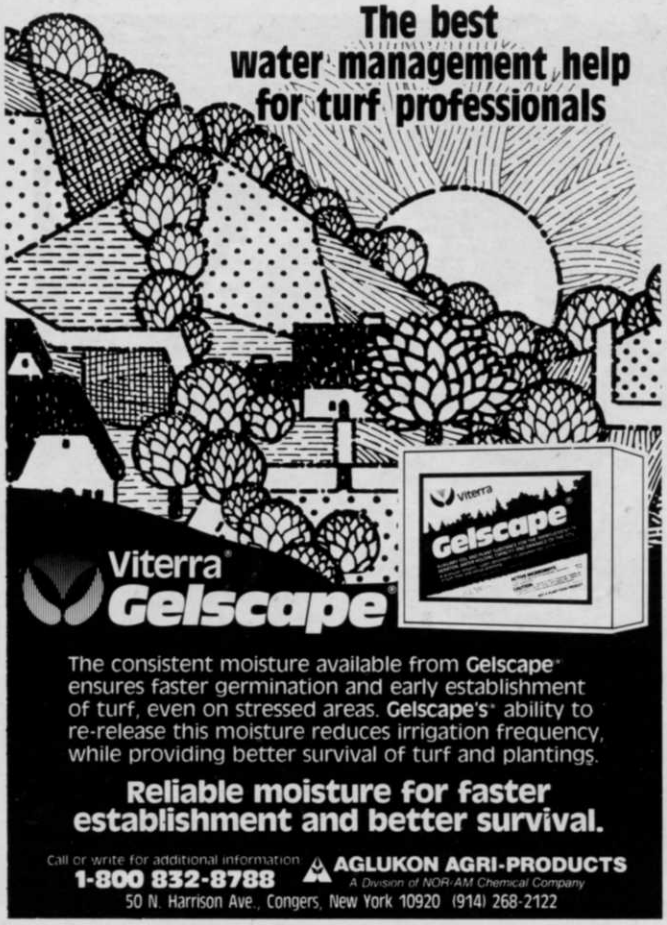
LANSING, Mich. — *Poa annua* (annual bluegrass) will remain an obstacle to superintendents well into the future, according to turfgrass experts at the Michigan Turfgrass Conference.

"We are never going to eradicate *Poa annua*," says Tom Perkins of DowElanco "The best that we can do is to educate everybody to its strong points and weak points, what you can and cannot expect of it, and tell you of the different tools available to you, to either manage it for survival or to reduce its impact on your total turf population."

Dr. Joe Vargas Jr. of Michigan State believes poa's staying power should make superintendents realize the need to accept it as a matter of course, especially on all-bentgrass tracks.

"We've seen a lot of golf

*continued on page 12*

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**POA** *from page 11*

courses in northern and southern Michigan built recently with bentgrass greens, tees and fairways," notes Vargas. "Once those (areas) get into shade, pretty soon you see a tremendous thinning of the bentgrass, and soon the annual bluegrass is in there.

"Whether you use PGRs, Prograss or whatever, you're going to have annual bluegrass in shaded areas. You're also going to have it in high traffic areas with tremendous amounts of wear and compaction. It's the only grass that can tolerate that compacted soil."

Perkins believes that "full-season survival (of annual bluegrass) almost becomes a genetic problem." He suggests that biotechnology could eventually be a solution.

DowElanco is embarking on biotechnology as it relates to green and growing plants. We haven't reached the point of manipulating the genotype that is *Poa annua*. That could be in the future."

Says Dr. Bruce Branham of MSU: "(Improving winter hardiness) is a question that gets into plant physiology and it is one that you can't do much about." about."

Branham believes poa's vulnerability to winter kill is one of the best reasons to try a different species.

"We're not going to manage our way out of winter hardiness without a much more genetic approach," Branham says. □

RESEARCH

## Mowing effects on nutrition begun by Bolens

KUTZTOWN, Pa. — A study to measure nutrient levels in soil after repeated grass cuttings has begun. It is sponsored by Bolens Corp., Port Washington, Wisc., and the Rodale Research Center here.

The three-year test also will determine the nutrient benefits of returning grass clippings to the soil with a mulching mower versus the collection and bagging of clippings with a conventional walk-behind mower.

The study was announced jointly by Bolens product manager Tom Wellnitz and Dr. Robert D. Hart, director of the Rodale Research Center.

"Bolens and Rodale have agreed to run this experiment because the disposal of grass clippings has become a major environmental concern for communities all across the country. We both believe a mulching mower can offer a very viable and effective solution," says Wellnitz.

"We wanted to objectively and quantitatively verify previous assertions that mulching returns increased nitrogen and nutrients to the soil."

Many of the reported benefits of mulching are based on a Michigan State University study done from 1972 to 1974. The study revealed that mulching produces a generally greener and healthier lawn because mulch particles decompose and are absorbed by the grass root system within 14 days.

Mulch, the study showed, returns nutrients to the soil and allows evaporation at the soil level without adding to thatch buildup.

The new tests, as announced by Bolens and Rodale, will be held at the research center's 305-acre facility in Kutztown, Pa.

Two identical grass-covered plots have been set aside. They will be mowed (the grass cut at specific heights) on a weekly basis—one with a Bolens walk-behind mulching mower and the other with a Bolens walk-behind rear bagging model with its collection bag attached.

Intermediate and deep soil cores will be taken before and after each growing season. They will be analyzed for leaching, nitrogen and other mineral and nutrient activity levels by the center staff and by Pennsylvania State University. □

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For more information, contact your Mobay distributor or Mobay sales representative. They can help you take your turf to new heights.

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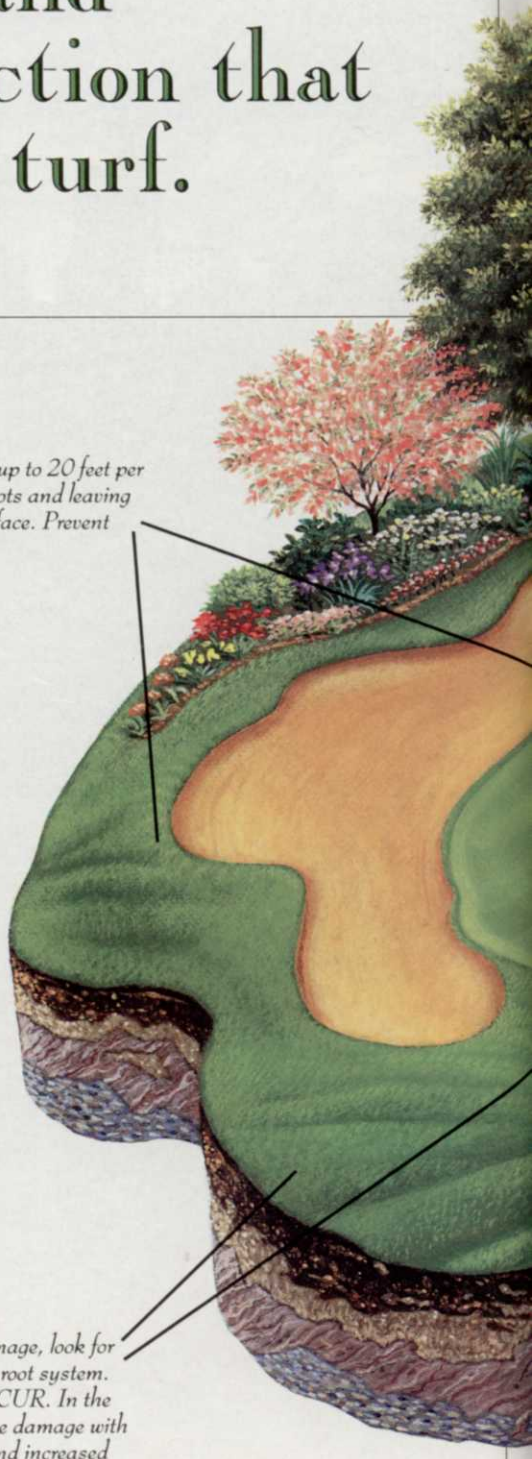

*Mole crickets can burrow up to 20 feet per night, feeding on grass roots and leaving mounds of soil on the surface. Prevent them with OFTANOL.*

*To identify nematode damage, look for wilted turf with a stunted root system. Then, treat with NEMACUR. In the interim, you can mask the damage with frequent, light watering and increased fertilization.*

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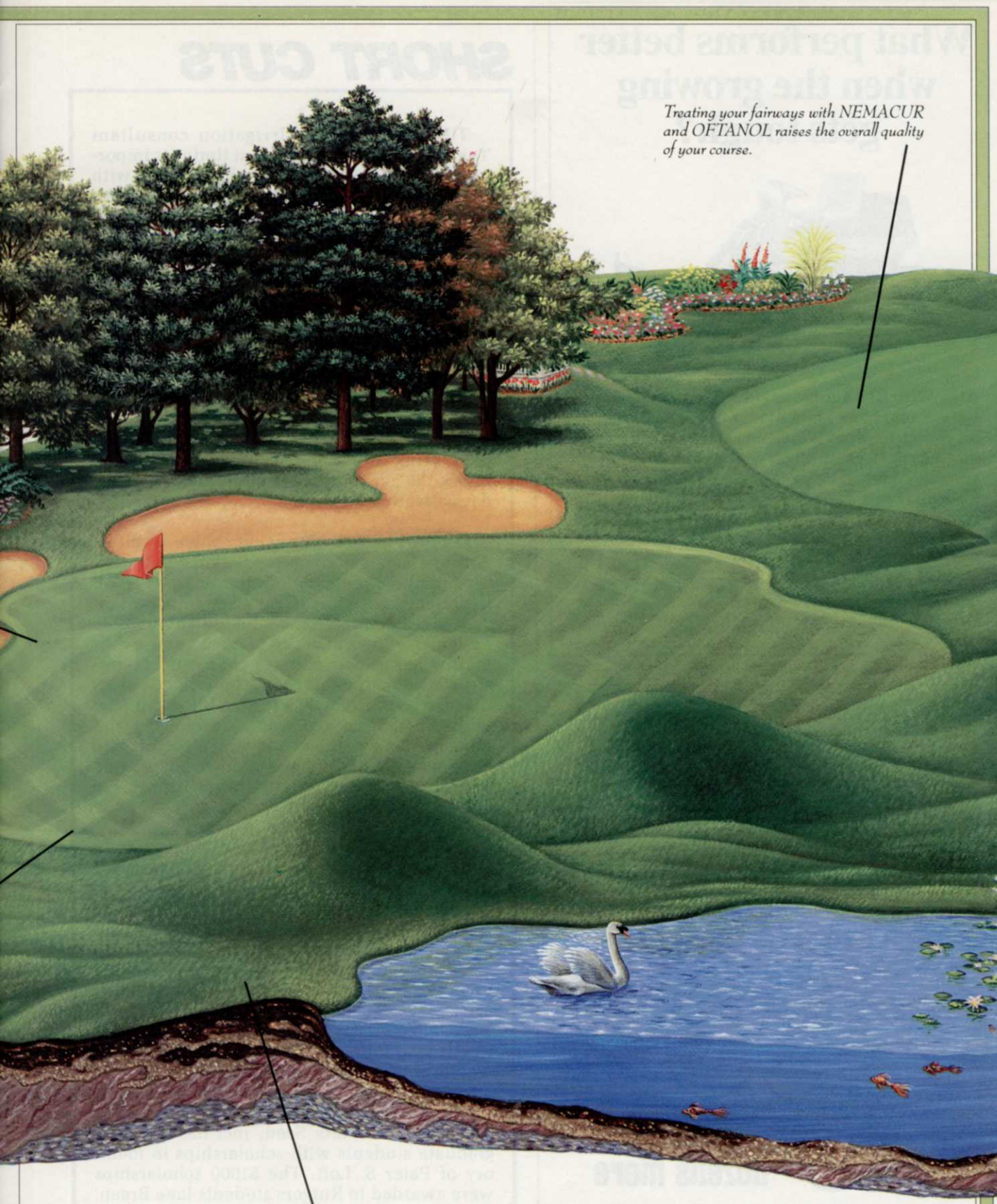
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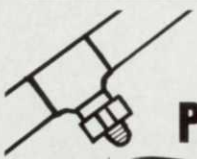

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# SHORT CUTS

**TIMING IS JOB 1...**Irrigation consultant **Tamas Tanto** has learned that timing is important in more ways than one when dealing with irrigation installation. "Basically, clients like a company because it completes the job on time," he says. "There's a real danger that an irrigation company can spread itself too thin when there's a lot of work. By the time a new golf course is ready for irrigation, the job is already way behind schedule."

Often, Tanto notes, course planners don't realize they are behind until the irrigation contractor arrives. In most areas, there is a very small time window in which the grass must be established. "This time cannot be negotiated," he adds. "It's important that the irrigation company bring in a well-oiled machine that can knock the job out, hole by hole, making up for days already lost."

**ON PAR IN THE '90s...**Golf course architect Arthur Davis has some predictions on the direction of his profession in the 1990s. "I think (architects) are going to get away from outlandish architectural styles and ridiculous hole designs in favor of more playable and easier maintainable golf courses that can be constructed at reasonable costs," he says. "Courses that can be built for $2.5 to $3 million can now be justified from a player's, developer's and homeowner's point of view. We're going to have to keep golf course costs down but provide a quality product. That's the challenge we face."

**FREE TREES...**To celebrate Arbor Day, a Southern California nursery donated one tree to area communities for every tree purchased during February at any of its 18 locations. Armstrong Garden Centers is expected to donate about 4,000 shade and specimen trees to area communities during its Treepeat Purchase Program. The program was praised by Los Angeles Mayor Tom Bradley who said, "This program reflects the type of corporate involvement it will take for California to address environmental concerns in the upcoming decade."

**THE NAME LIVES ON...**For the seventh consecutive year, Lofts Seed, Inc. has awarded graduate students with scholarships in memory of Peter S. Loft. The $1000 scholarships were awarded to Rutgers students Jane Breen, Leslie Rickert Campbell, Melodee Kemp, Kathi Hoffman Knight, Karen Plumley, Suichang Sun and Margaret Waters.

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## Banff

Kentucky Bluegrass

Banff is a vigorous dwarf variety that was discovered on the Banff Springs Golf Course in Alberta, Canada. There, Banff survived twenty years of continual heavy watering, repeated attacks from snow mold, and close mowing on a putting green. Just imagine what it could do for you. Banff establishes quickly and forms a disease resistant, cold tolerant, dark green turf.

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## MUSTANG

TURF-TYPE TALL FESCUE

Mustang is the tall fescue that looks like bluegrass. Its finer texture, darker green color, and wear and drought tolerance have made it the choice for sports field, sod, park, and home lawn use. Mustang is available straight or in TEAM – a three-way turf-type tall fescue blend that also contains Maverick II and Thoroughbred.

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Colt is an Oregon produced variety that offers you domestic seed production benefits. It combines superior turf performance and turf quality with genetic adaptation to North American growing conditions. It is dark green, shade tolerant, disease resistant, and very winter hardy. Colt is a vigorous, low-growing variety that has excellent overseeding qualities.

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For the fourth consecutive year Victory was the highest rated commercially available chewings fescue in the national Fine Fescue Trials. Victory is a low growing, shade tolerant variety that has possibly the darkest green color of any other chewings fescue. It exhibits superior uniformity and disease resistance, too. If you like picking winners, pick Victory.

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### KENTUCKY BLUEGRASS

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Pickseed also produces the following quality turfgrass varieties: Agram chewings fescue, Jasper creeping red fescue, Jazz perennial ryegrass, Alpine Kentucky bluegrass, Exeter colonial bentgrass, and National creeping bentgrass.

## SHORTSTOP
### TURF-TYPE TALL FESCUE

Shortstop is the little guy with big benefits. As its name implies, Shortstop is a slower and shorter growing variety of turf-type tall fescue. But don't let its stature fool you. Shortstop is plenty tough. It has heat and cold tolerance, disease resistance and is widely adapted. Shortstop forms a beautiful, dense, uniform turf of finer, darker green leaves.

## BRONCO
### Kentucky Bluegrass

Bronco is a very wide bladed Kentucky bluegrass that was developed specifically as a mix companion for turf-type tall fescue. While its texture and color gives it the appearance of a tall fescue, the comparison between the two ends there. Bronco is elite Kentucky bluegrass all the way. Its been bred to be less dense so it won't crowd out tall fescue and yet still aggressive enough to fill in and repair damaged areas quickly. That's what makes Bronco ideal for sports turf use.

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LAWN CARE

# IPM can protect industry into the '90s

LANSING, Mich.— Dr. Mark Raupp of the University of Maryland believes Integrated Pest Management (IPM) will help lawns and company coffers stay green in the 1990s.

"Improper management practices can feed on the economics of what we do," warns Raupp. He adds that negative public perception will also play an increasing role in the success or failure of lawn care businesses.

Raupp defines IPM as "the selection, integration and implementation of pest control in predicting economic, ecological and sociological consequences."

Among the fundamental biological reasons for using IPM, Raupp says, is that the practice eliminates exposure of non-target organisms, both non-infected plants and beneficial predator insects.

**Dr. Mike Raupp: "Eradicating pests is not a realistic objective. Practice IPM."**

One of the common results of cover sprays, Raupp notes, is that the primary pests resurge quicker than the helpful predator. In tests conducted by the university, cover sprays for general pests controlled the beneficial organisms, but were very poor in controlling the pests. In those situations, secondary pest outbreak occurred.

"Eradication is not a realistic objective," insists Raupp. "There are always going to be pests in the system. What you want to do is manage your pest populations below a damaging level. The beneficial predator insects need certain low levels of target pests for sustenance.

"Understand the key pests in the system, know how to identify them and know their life cycles. "You also need a proper monitoring approach, decision making guidelines and alternative control tactics. Then put it together into an overall management plan with some means of evaluation."

Raupp says proper monitoring yields the informa-

*continued on page 23*

## ...and in Florida

GAINESVILLE, Fla. — Integrated Pest Management could easily grab a dominant foothold in this state, if the results of a recent survey are indicative.

"From the results of this survey, the future of urban landscape IPM appears to be promising," notes Wendel Martinkovic, reporting for the Florida Cooperative Extension Service. "The unusually high response shows an openness and an acceptance of these new practices."

He cites improved water and fertilizer use, proper mower height and sharp mower blades and leaves, and the use of resistant plant varieties as most pop-

*continued on page 23*


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# ATHLETIC TURF

**Harry Gill (seated, center) gets a standing ovation from the dais as he is named permanent special advisor to the STMA Board of Directors. Honoring Gill are (from left): executive secretary Mark Hodnick, president George Rokosh, "Lawn Ranger" award-winner David Frey and Bruce Shank of *Sports Turf*.**

## STMA honors members

The Sports Turf Managers Association honored **David Frey**, **Harry Gill** and two students during its recent annual conference in Houston, Texas.

Frey, head groundskeeper at Cleveland Stadium, was recipient of the "Lawn Ranger" award, honoring the STMA's groundsman of the year. Gill, head groundskeeper at Milwaukee County Stadium, was named "Man of the Year" by *Golf and Sports Turf* magazine.

**George Wehrmaker**, a senior at Texas A&M University, received the $500 Harry Gill Scholarship; **Patrick Sherer**, a freshman at Cal Poly Pomona, received the Jeff Wishard Scholarship.

New STMA president **George Rokosh** of the College of DuPage (Ill.) took the gavel from **Steve Cockerham** of the University of California at Riverside, who becomes immediate past president. Other officers are: president-elect **Twyla Hansen** of Nebraska Wesleyan University, vice president **Larry Elliott** of Missouri Paint Supplies, treasurer and executive director *pro temp* **Mark Hodnick** of Cal Poly Pomona, and secretary **Gil Landry** of the University of Georgia.

Other members of the board of directors are: **Dale Sandin** of the Orange Bowl, **Ken Mrock** of the Chicago Bears, **John Culbertson** of Pacific Sod, **David Minner** of the University of Missouri and **Greg Petry** of the Waukegan (Ill.) Park District.

Gill, an STMA co-founder, was also named permanent special advisor to the board.

With 125 registered guests, the STMA convention grew by 50 percent over its 1988 edition, according to office manager **Gini Scharfman**. The 1990 annual conference will be held at the beginning of December.

**IPM** *from page 21*

tion needed to pinpoint pests in time and location.

"Contrary to popular belief," says Raupp, "pests are not everywhere all the time."

And don't discount the presence of pests during the winter, says Raupp, who encourages companies to visit home sites once or twice during winter months to monitor insect presence. □

**Heiny extolls virtues of aerification equipment.**

LANDSCAPING

## Fertilization, mowing and water are keys to quality

LAGUNA HILLS, Calif. — "You can do more with turf in terms of appearance easier and quicker than any other part of the project," says Dan Heiny, owner of Allseasons Landscape. "Irrigation, fertilization and mowing are the keys."

Heiny offered tips to fellow landscapers at a recent show. Here are exerpts:

- Always mow dry ground. Be sure the lawn is not watered the day prior to mowing. Also, never mow twice in the same direction.
- Fertilize every month with a uniform supply of fertilizer.
- Don't use string trimmers around trees. If customers insist on grass abutting trees, tell them it's risky. Instead, use a hoe, shovel or handpick to make a six-inch dirt barrier around the tree. And be sure not to mow too close to the tree.
- Aerify regularly. "It'll make you look like a real whiz," Heiny says. "An aerifier is one of the best machines you can use." Afterwards, water to break up the plugs, then mow.
- Test soil moisture regularly.
- Check drainage regularly, especially on rainy days.
- Clear weeds in the walkways. "It's something that gives the extra little detail to a project," he says.
- Check for tree roots in the asphalt. If unchecked, they will eventually break the asphalt and you could be held liable.
- Specify snail and gopher control. These are time-consuming jobs, so the contractor should not be responsible unless they are specifically stated in the contract. □

**FLORIDA** *from page 21*

ular IPM techniques.

Other perceptions of Florida's lawn and landscape professionals were judged by the survey. Some of the perceptions:

- regulations concerning pesticides used in the urban landscape;
- safety practices;
- the cost of pesticides;
- the number of insects believed to becoming resistant to commonly-used pesticides; and
- public awareness about alternative types of pest control, including IPM.

The survey has caused the Florida Cooperative Extension to take action.

"A media campaign has been initiated," Martinkovic reveals. "It is aimed at increasing awareness of urban landscape IPM, since PCOs perceive the public as not aware of these practices." □

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PRODUCTS

## Pennant herbicide expands uses

GREENSBORO, N.C. — The EPA has approved several label amendments for Ciba-Geigy's Pennant liquid and granular herbicide for problem weeds in ornamentals.

Now, the product may be used on all landscape and nursery plantings, including in residential landscapes. Previously, it was only allowed on plants in commercial landscapes and ornamental nurseries.

"This revision greatly expands the number of sites where Pennant can be used," says Dr. Doug Houseworth, Ciba-Geigy's manager of technical support. "New users will be able to take advantage of the product's excellent weed control properties, particularly against difficult-to-control yellow nutsedge."

The number of container-grown ornamental plants on which Pennant can be used increases from 5 to 50, and more weeds are included on its label. Other application recommendations include:

- application with liquid and dry fertilizer;
- application through overhead or microjet irrigation;
- using Roundup as a tank mix if desired;
- over-the-top applications;
- no waiting between transplanting and treatment;
- use on high organic peat and muck soils if desired; and
- more flexible carrier volume. □

INSURANCE

## Insurance difficult for self-employed landscapers

COLUMBUS, Ohio — Tighter enforcement of some health insurance policies could leave self-employed landscapers with no recourse in the event of injury. At least, that's what's happening in Ohio, according to a noted agricultural economist.

Warren Lee of the Agricultural Research and Development Center at Ohio State University has been receiving reports of self-employed people being unable to get their health insurance to cover medical costs from work-related injuries.

"Apparently," says Lee, "insurers now want to make sure such claims go through the workers' compensation system. That's a real concern for self-employed people without workers' compensation."

According to Lee, self-employed people may erroneously think their family health insurance or coverage offered by their spouses will cover all medical bills.

Dale Chuba, director of member services for the Ohio Farm Bureau Federation, says it is possible not only for farmers but also other self-employed people to obtain insurance that automatically covers work-related injuries.

If a worker's current insurance plan does not cover work injury, it is possible to buy into the workers' compensation system. Premiums are determined by a formula that includes payroll and risk factors. Another formula is used to calculate biannual premium payments. □

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Bayard Sheldon, left, president of Silver Creek Landscaping in Sacramento, says that they use Embark as an edger and trimmer to keep Bermuda from creeping into flower beds or growing ragged around tree wells and fence lines, as well as encroaching on sidewalks, driveways and walls. Center is Nick Subia, general manager of the maintenance division; and, right, is Charles Sheldon, Silver Creek vice president.

Robert McKindles, supervisor of grounds maintenance at Northwood Institute near Midland, Michigan wanted his entrance road to have a manicured look comparable to the ornamental turf on the main campus. He used two treatments of the PBI/Gordon fine turf program, the first in early spring, and the second in midsummer. "The roadsides were only mowed twice," says McKindles, "and the color was as beautiful as any turf on the campus."

# If you mow or manage ornamental turf, Embark® can help in many ways:

PLANT GROWTH REGULATOR

**All over America, professionals are experimenting with ways to improve their business with Embark® Plant Growth Regulator. Read how four landscapers with totally different goals are more successful because of the way they use Embark.**

**Everett Mealman,** President
PBI/Gordon Corporation

Because Embark is a true plant growth regulator that redirects energy from seedhead development and stem elongation to root growth, there is almost no limit to the ways a turf professional can use it by adjusting the rate to fit the problem.

The experiences of Kevin York and Gil Chapel are one illustration of the many ways we have found that professionals are using Embark beyond the standard PBI/Gordon fine turf program.

York and Chapel work closely together in suburban Kansas City. In fact, they actually share office space. York owns York Lawns, Inc., and specializes in mowing, trimming, installation of sod and ornamentals as well as irrigation systems. Chapel owns Lawn Pro of Olathe and specializes in lawn and landscape management of fertilizing, insect, weed and disease control.

Chapel has very carefully followed the development of PGRs since they first came on the scene. Little wonder, since he has a Ph.D. in chemistry and is active in the monthly Professional Grounds Maintenance Society educational programs. His expertise in landscape management is highly visible on many of suburban Kansas City's most beautiful commercial and residential developments.

**...and from such knowledge** he was able to help his friend Kevin York use Embark in his mowing contracts last year when abnormal rainfall caused excessive growth that threatened to get out of hand.

"Most of my accounts are on a per-mow basis," says York, "so my mindset is inclined toward investing in mowing machine maintenance and employee training rather than buying chemicals to reduce growth. But I was willing to try anything that would help me keep up with the avalanche of growth and scheduling problems caused by all the rain."

**And thus it was** that Chapel applied a low rate of Embark and Limit® on several of the properties York was mowing — to slow down the growth. The chemical cost to York was only about $10 per acre.

According to York, it was one of the most profitable investments he has ever made. It not only slowed down the growth so that double mowing was eliminated, but it also reduced the man hours and mowing machine maintenance per acre.

Use rates and timing vary according to geographical area and with weather conditions, as well as with turf species.

But this is just one way professionals are experimenting with low rates of Embark PGR in the Kansas City area.

Consider the experience of Northwood Institute, near Midland, Michigan.

The entrance road at Northwood Institute is almost a mile long and winds through natural ground covers of majestic oaks and pines. The berm tapers off into a ditch on

each side that is well turfed but extremely difficult to mow.

Because the entrance road is such a vital element of the overall campus image, the Institute wants it to have a manicured look rather than your conventional highway look.

After considering all of the alternatives, Robert McKindles, supervisor of grounds maintenance at Northwood Institute, elected to treat the roadside with the fine-turf rate of Embark in a tank-mix with Ferromec® AC Liquid Iron — one pint of Embark plus 2.75 gallons of Ferromec AC per acre.

**"The first treatment** went down in early spring," says McKindles, "and it held the grass in a neat, attractive condition for six to seven weeks. Ten weeks after the first application went down, the roadsides were mowed and a second application went down.

"It held the growth sufficiently that only one more mowing was needed," continues McKindles, "and the color was as beautiful as any of the turf on the entire campus."

While use rates and timing may vary in other geographical areas and with weather conditions, Embark proved an invaluable tool at Northwood Institute.

Embark is also a priceless tool for edging and trimming. Just ask the folks at Silver Creek Landscape in Sacramento, California.

Sacramento has to be the ground cover capital of the world. At least 50% of the landscape consists of creative placement of rocks, bark, ivy, and a wide variety of trees.

Kevin York, left, owner of York Lawns, Inc. and Gil Chapel, right, owner of Lawn Pro, show Everett Mealman one of the commercial properties where they slowed down the growth of the grass. "Using Embark to reduce the man hours per acre for mowing is an idea whose time has come for mowing contractors," says York.

"We use Embark as an edger and trimmer," says Bayard Sheldon, president of Silver Creek Landscape, headquartered in the suburban Rancho Cordova area of Sacramento. "Sometimes I think we should call ourselves *manicurists*," laughs Sheldon, "because it seems that so much of our effort revolves around keeping Bermuda from creeping into flower beds or growing ragged around tree wells and fence lines, as well as keeping our ivy ground cover from encroaching on sidewalks and driveways and climbing up the sides of buildings. I don't know how we could keep up with it without the use of Embark to keep everything in its place.

## The standard program for using Embark on irrigated fine turf

If Embark is a tool with virtually endless applications in landscaping, the standard Embark/Ferromec AC/Trimec® Herbicide program for fine turf is surely becoming the most significant development in recent years for reducing mowing costs, while at the same time brightening up the color of turf and strengthening its root system.

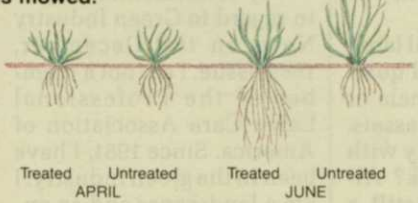
Ferromec AC, because of its patented nitrogen-iron bonding process, works within 48 hours to fix the color. The Embark kicks in later with its task of suppressing the growth rate of the turf by redirecting the energy from seedhead development and stem elongation to root development.

The Embark/Ferromec AC treatment costs about $42.00 per acre for the chemical and, since it is applied with a regular herbicide treatment of Trimec, it gets a free ride as far as cost of application is concerned.

The program will save two to four mowings during a seven- to eight-week period and, since the cost of mowing is known to be at least $45.00 per acre, the savings can be as much as $135 per acre per treatment.

## Why Embark-treated grass develops deeper roots:

**Research shows that when grass is treated with Embark, the energy that would naturally produce seedheads and stem elongation is redirected to the roots. This phenomenon occurs regardless of whether or not the grass is mowed.**




## Shouldn't you try Embark?

**The evidence is clear that Embark is changing the economics of turf management. As with any PGR, application rates and timing, as well as the condition of the turf and weather, are vital to successful use. To learn more about Embark PGR call our Sales Service Group. Ask for a free copy of the Embark PGR Professional Vegetation Management Applicator's Guide.**

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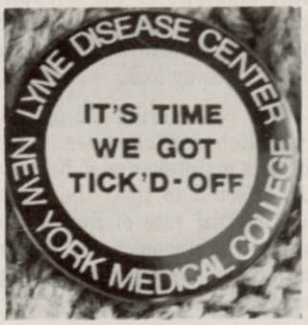
INDUSTRY

## DowElanco pays to get 'Tick'd Off'

RYE BROOK, N.Y. — DowElanco donated $2,000 to the New York Medical College's recent Lyme Disease Benefit here, the theme of which was "It's Time We Got Tick'd Off."

More than $180,000 was raised at the event to fund Lyme disease research at the medical college, a leading research facility committed to studying deer ticks and Lyme disease.

"We were proud to have been part of the benefit, as were our guests from the pest control and lawn care industries," says Dr. Brian Bret, technical service and development specialist for DowElanco. "It is these industries that are providing one of the front lines of defense against the deer tick."




According to sources, proceeds were critical to support research. □

# LETTERS

## Taking issue with an LM ad

To the editor:

While paging through the January issue of LANDSCAPE MANAGEMENT, I was stopped in my tracks by a full-color ½-page ad. It featured a lovely young lady in a bikini selling...? Gosh, what *was* she selling? Seed? Chemicals?

I certainly don't consider myself a militant feminist, but in this day and age what is the point of this kind of advertising? (I would feel the same way about Joe Montana endorsing a Ditch Witch in his briefs—honest!)

We are facing a real labor shortage in which all qualified professionals, male or female, are valuable assets. Why alienate anybody with such archaic schlock? Although women are still a minority at the conferences, meetings and trade shows I attend, our numbers are increasing. Professionalism in our industry is something that is constantly reinforced, and professional women fill the issues of LANDSCAPE MANAGEMENT. Why the inconsistency in attitudes?

Let's keep up with the times, please! If your readers need this kind of advertising "fix," they should ask one of their tool reps for a calendar.

**Cheryl Vander Weit**
*Lied's Inc.*
*Sussex, Wisc.*

## The side of an environmentalist

To the editor:

Congratulations on doing a superb job bringing so much information to readers each month in your magazine. Each issue is full of great ideas in articles and advertisements.

My letter comes to you in regard to Green Industry News in the December, 1989, issue. I am not a member of the Professional Lawn Care Association of America. Since 1981, I have been in the green industry. I am a landscaper and an environmentalist. It seems that Jim Brooks, executive director of the PLCAA, would find me an enigma. He declares, "Our new competitors are the environmentalists and legislators." Will Jim and his membership be the last people on Earth to realize that there can be no competition in the struggle to pre-

*continued on page 32*

# Make this the last time you spend time changing nozzles.

**Upgrade to Quick TeeJet®.**

Ever notice how the little things that shouldn't interfere with getting our work done are often the things that throw us off schedule?

It's time to make sure that changing, replacing and cleaning spray tips never eats up a morning again.

Now, an easy-to-use checklist shows you how easy it is to order and install the Quick TeeJet System.

With Quick TeeJet System all it takes is a flick of the wrist to change spray tips. Pop in a new tip, give the nozzle a quarter turn and the tip is locked, aligned and ready to go. In no time at all.

The optional Chem Saver™ Diaphragm Check Valve saves money by saving chemicals. It eliminates nozzle drips when you shut down the system.

Get the brochure. Eliminate the problem.

TeeJet®

*No better way to spray today's chemicals.*

**Spraying Systems Co.** North Ave., Wheaton, IL 60188

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Complete and return this coupon for the guide to ordering and installing the Quick TeeJet System on your sprayer. **LM-4**

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Mail to: Spraying Systems Co., Agricultural Division, North Ave., Wheaton, IL 60188

# If you run into a turf-management keep running.

But for virtually every other turf-management problem you face, you can count on a quality Chipco® product to deliver the proven performance you demand.

Take our premium fungicides, for example. Chipco® brand 26019 fungicide provides unsurpassed control of all major turf diseases. And its long-lasting protection makes it the perfect foundation for a season-long disease control program.

For Pythium control, you can't beat Chipco® Aliette® brand fungicide. Its powerful systemic action protects turfgrasses for up to 21 days.

Grubs, mole crickets and surface-feeding insects a problem? Depend on the powerful twosome of Chipco® Mocap® 5G and Chipco® Sevimol.® Chipco® Mocap® 5G pesticide delivers effective, fast, dependable control of grubs, mole crickets—all species—and a wide variety of surface-feeding pests.

Chipco® Sevimol® is a special liquid formulation of Sevin® brand carbaryl insecticide for broad spectrum defense against grubs, sod webworms, chinch bugs, bluegrass billbugs, mole crickets and more than two dozen other turf pests. Chipco®

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# problem Chipco® products can't solve,

Sevimol® can be used to protect your trees and ornamental plantings, as well.

Chipco® Ronstar® brand herbicide tackles more than 20 of the toughest broadleaf and grassy weeds—including goosegrass and crabgrass—for up to 120 days from a single pre-emergence application.

And Chipco® Weedone® brand DPC herbicide gives you unmatched post-emergence control of more than 65 annual broadleaf weeds.

So, for the turf-management problem Chipco® products can't solve, keep a pair of sneakers handy. For all the others, turn to the first name in quality turf care: Chipco®.

Chipco®

RHÔNE-POULENC

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As with any crop protection chemical, always read and follow instructions on the label.

# EVENTS

## MARCH

**13-14: Metropolitan Detroit Landscape Association's trade show and convention,** Michigan Mart Building, State Fairgrounds, Detroit. Contact: Dan Bywalec, (313) 534-5515.

**15: "Managing Landscape Dollars—Commercial and Multi-Housing,"** Clarion Hotel, Ontario, Calif. Contact: University of California, Riverside; (714) 787-4105 or (800) 442-4990.

**16-18: Controlling Tree Use Seminar,** Tampa, Fla. Contact: American Society of Consulting Arborists, 700 Canterbury Rd., Clearwater, FL 34624; (813) 446-3356.

**19-22: Florida Agribusiness Computer Short Course,** St. Petersburg Junior College, Clearwater Campus. Contact: Agribusiness Computer Short Course, IFAS Conferences Office, 551 IFAS, University of Florida, Gainesville, FL 32611; (904) 392-5930.

**25-29: American Society of Golf Course Architects annual meeting,** Spanish Bay Golf Course, Pebble Beach, Calif. Contact: ASGCA, 221 North LaSalle St., Chicago, IL 60601; (312) 372-7090.

**24-25: Louisiana Cooperative Extension Spring Garden Show,** New Orleans Botanical Garden. Contact: Nannette Simmons or Severn Doughty, (504) 486-4054.

**27-28: 31st Annual Conference,** University of California at Riverside Department of Entomology. Contact: University Entomology Dept. at (714) 787-3718.

**28-29: "Perennials in the Landscape"** University of Minnesota, Waseca, Horticulture Dept. Contact: Joan Barrett at (507) 835-1000 or Ainie Busse, (612) 286-2654.

## APRIL

**6-8: Associated Landscape Contractors of America Student Field Days,** Colorado State University, Fort Collins, Colo. Contact: Elizabeth Mogen, Horticulture Department, C.S.U., Fort Collins, CO 80523; (303) 491-7089.

**9-11: American Society of Landscape Architects annual conference,** Washington D.C. Convention Center. Contact: ASLA, 1733 Connecticut Ave. N.W., Washington, DC 20009; (202) 466-7730.

**LETTERS** *from page 28*

serve, conserve and restore our resources?

The 1990s bring new threats from old problems that have grown out of scale. We must all look back at our mistakes to protect our future. We must all work together to correct the mistakes made out of greed and ignorance. The lawn care industry is no exception.

As an environmentalist, I will be watching PLCAA and the whole green industry. I will take issue with anyone who demonstrates by their actions that I or the legislatures I support are competitors.

As a landscaper, I will strive to preserve, conserve or restore every resource on this precious Earth.

To all my colleagues in the green industry: Support a local environmental organization with your time, knowledge or money. It will be worth it.

**Jeff Caster**
*Caster Landscape & Design*
*Tallahassee, Fla.*


Use Tractor Power!
Olathe
Model 166HL PTO Powered Turf Sweeper

Turf Sweeper featuring 9 ft. hydraulic high lift dump and 5 cu. yd. hopper. Two reel mechanical pickup with hydraulic raise/lower from operator's seat. PTO powered eliminates a second engine.
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Industrial Airport, KS 66031
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Powerful & Rugged!
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Model 31 Leaf & Debris Loader

20 or 24 HP Loader picks up and loads leaves, grass, and other debris. Trailer mounted with 12" intake with 9' extension, reaches hard to sweep areas.
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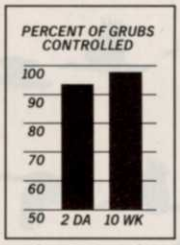
Circle No. 150 on Reader Inquiry Card

When it comes to grubs, it's not enough just to suppress them.



Compiled from 18 university trials, 1985-86.

You want to squash them. Pulverize them. Grind them into dust. Send the little buggers to the root zone eternal.

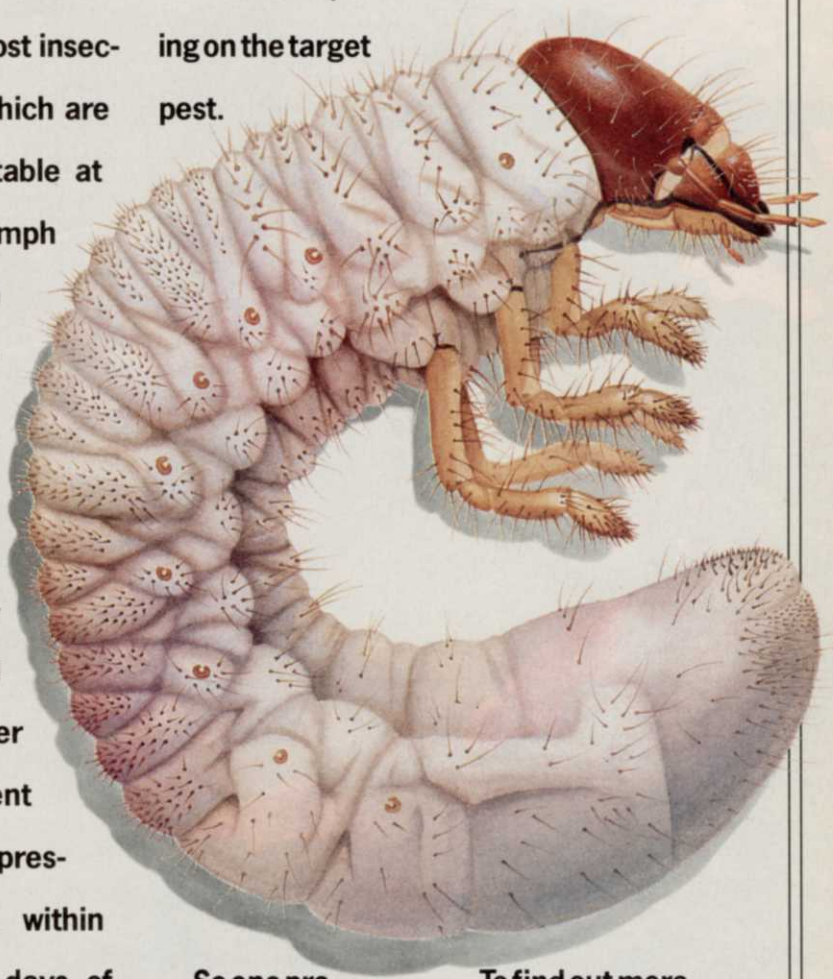
And who could blame you?

After all, this one creature has probably baffled more turf professionals, made a mockery of more chemical company claims, than all other turf insects combined.

Triumph® is changing all that.

Unlike most insecticides, which are unpredictable at best, Triumph has been proven in over ten years of testing to consistently rid turf of over 90 percent of grubs present. And within just 2-3 days of application.

Better yet, once applied to the soil, Triumph keeps on working for up to 10 weeks, depending on the target pest.



So one preventive application in late summer or early fall is all that's needed to protect turf from costly grub damage.

And protect you from losing what profits you have made to callbacks.

To find out more, contact your turf products distributor or Ciba-Geigy representative.

**TRIUMPH**

## HOW TO SQUASH A GRUB.

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For retail sale to and use only by certified applicators or persons under their direct supervision, and only for those uses covered by the applicator certification.

*For best results, thoroughly irrigate prior to treatment. Follow your application by watering in to a depth of 1 to 1½ inches.*

DYLOX and OFTANOL are Reg. TMs of Bayer AG, Germany ©1989 Mobay Corporation

# When you have grub control this effective, you have grounds to celebrate.

*DYLOX controls armyworms, bagworms, and stink bugs on your trees, shrubs, and flowers as well as controlling cutworms and sod webworms on your turf.*

*OFTANOL also controls billbugs, cutworms, chinch bugs, Hyperodes weevil, and sod webworms.*

*To identify grub populations, look for patches of wilted, dead or dying turf. Grub-infested turf has pruned roots which make it easy to pull back like carpet.*

Some of the most celebrated courses in the country turn to Mobay products for *grub protection*.

For preventative treatment, there's OFTANOL® Insecticide. It controls *grubs* longer than any other product available. Apply it in the spring before *grubs* show up. After all, spring rains and temperatures can mask a *grub* problem.

Or apply a pre-damage application of OFTANOL when *grub eggs* hatch and activity begins (usually right after a drought-breaking rain in the early fall). But only apply OFTANOL once a year. If you've already used it in the spring, treat with DYLOX® Insecticide.

Of course, if grub damage turns up, apply DYLOX followed by heavy watering. DYLOX controls *grubs* in as little as 24 to 48 hours.

For more information, contact your Mobay distributor or Mobay sales representative. They can help you make your turf look great. And that makes you look great. Which is cause enough to celebrate.

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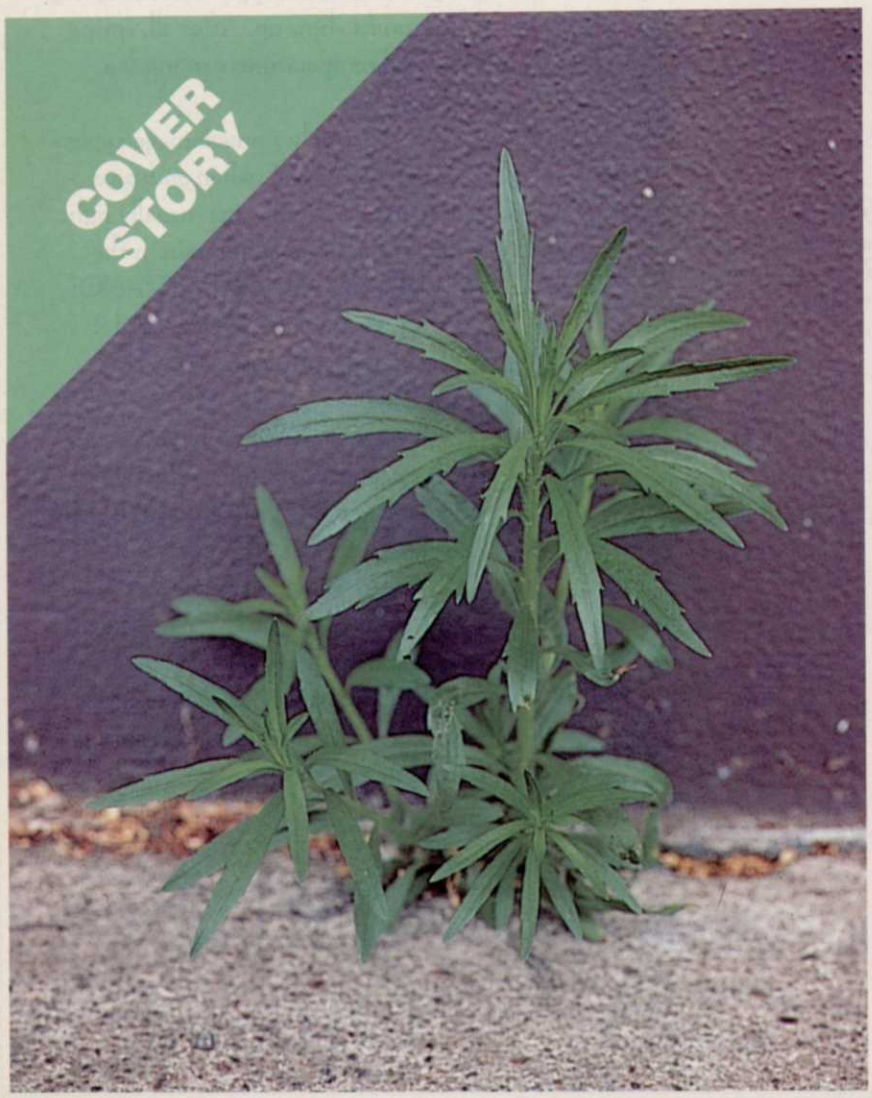
Circle No. 137 on Reader Inquiry Card

# POST-EMERGENCE WEED CONTROL IN COOL-SEASON TURFGRASSES

For effective post-emergence weed control, the plants should be actively growing and the herbicide sufficiently absorbed.

*by Bruce E. Branham, Ph.D., Michigan State University*




Post-emergence weed control is the application of a herbicide to an established weed to achieve control. It is fundamentally different from pre-emergence weed control in several ways. First, the herbicide is applied directly to the weed which permits the use of spot applications. Second, environmental conditions are important because they affect the amount of herbicide absorption which is ultimately related to control.

### Principles of post-emergents

Effective post-emergence control depends on three simple principles. First, the growth stage of the plant is critical. In general, the younger the plant, the easier it is to control. This is most applicable to annual plants, however, even established perennials have growth periods where control is more easily achieved.

As an example, fall is an excellent time to control established perennials because they are storing food reserves in their root systems and the herbicide will be transported to the roots, killing the entire plant.

Second, the weeds must be actively growing in order to take up a sufficient dose of the herbicide for effective control.

When weeds are actively growing, they are translocating photosynthate to the plant's growing sites. The absorbed herbicide can be carried with the photosynthate to these growing sites which are often the site of the herbicide's action.

When weeds are actively growing, they tend to be more succulent and possess a thinner cuticle. The cuticle is the chief barrier to herbicide absorption, and when plants are actively growing the cuticle tends to be less well developed. As plants enter periods of high temperature and particularly drought stress they tend to develop thicker (i.e. waxier) cuticles.

### Absorption is critical

Third, the herbicide's absorption by the plant is the controlling factor in getting sufficient herbicide activity.

It is estimated that, depending upon the herbicide, only 15 to 60 percent of the herbicide deposited upon the leaf is absorbed into the plant.

Thus, an area for fruitful research in the future is to examine methods to increase the absorption rates to 85 to 100 percent. Such advances would permit lower application rates to be used. In fact, significant advances are currently being made in the area of additives to increase herbicide absorption.

These factors—plant growth stage, herbicide absorption and plant growth rate—control the effectiveness of post-emergence herbicides.

This preliminary discussion sets the stage for the five weed control areas.

### Broadleaf weed control

Controlling broadleaved weeds is an

**TABLE 1.**

## Broadleaf weed control herbicides for use in cool-season turf

2, 4-D
2, 4-DP
MDPP
MCPA
dicamba
triclopyr
clopyralid

Some commonly used broadleaf herbicide mixtures and the ratio of each product in the mix:

2, 4-D + MCPP
2 plus 2 (1/1) Fermenta
Lescopar (1/2) Lesco
2, 4-D-MCPP (2/1) Cleary's

2, 4-D + dicamba
Phenaban 801 (8/1) Gordons
Eight-one selective herbicide (8/1) Lesco
Riverdale 81 selective weed killer (8/1) Riverdale
Riverdale 101 weed killer (10/1) Riverdale

2, 4-D + MCPP + dicamba
Three way selective herbicide (1/0.5/0.009) Lesco
Trimec (1/0.5/0.1) Gordons
Trimec Bentgrass Formula (0.3/1/0.13) Gordons
Trexsan (1.0/0.53/0.13) (Sierra)
Trexsan Bent (0.3/1.0/0.13) (Sierra)

2, 4-D + 2, 4-DP
Chipco Weedone DPC (1/1) [ester] Rhone-Poulenc
Chipco Weedone DPC Amine (1/1) Rhone-Poulenc
Turf D + DP (1/1) [ester] Riverdale

2, 4-D + 2, 4-DP + MCPP
Weedestroy Triamine (1/1/1) Riverdale
Weedestroy Triester 80.7/1.0/0.7) Riverdale

MCPA + MCPP + 2, 4-DP
Weedestroy Triamine II (1/1/1) Riverdale

MCPA + MCPP + diacamba
Trimec Encore (1.0/0:46/0.1) [amine] Gordons

2, 4-D + 2, 4-DP + dicamba
Super Trimec (1.0/1.0/0.25) [ester] Gordons

2, 4-D + triclopyr
Turflon D (2/1) [ester] Dow
Turflon II (2.6/1) [amine] Dow

triclopyr + clopyralid
Confront (3/1) [amine] Dow

**TABLE 2.**

## Post-emergence grass and sedge control herbicides

| Common Name | Trade Name | Manufacturer |
|---|---|---|
| MSMA + DSMA | Daconate | Fermenta |
| | Broadside, DSMA 81% | Vertac |
| | Ansar, DSMA liquid | Drexel |
| | Methar 30 | W.A. Cleary |
| fenoxaprop | Acclaim | Hoechst |
| bentazone (sedges only) | Basagran | BASF |

## Special use situations

Sometimes we don't understand why things work the way they do, but we use them anyway. A good example of this is the control of creeping speedwell with DCPA (Dacthal).

Dacthal is a pre-emergence grass herbicide that effectively controls creeping speedwell (a difficult-to-control broadleaf weed) when applied after emergence of the speedwell. You figure it out.

Another special-use situation is the control of tall fescue in Kentucky bluegrass with chlorsulfuron (Lesco TFC).

This product will remove coarse-bladed tall fescue from Kentucky bluegrass with a single application. The product has a very long soil residual so be careful when using it.

It will also eradicate perennial ryegrass from Kentucky bluegrass, which opens up some interesting possibilities for golf courses and home lawns where a pure Kentucky bluegrass turf is desired but ryegrass was included in the seed mixture for establishment purposes.

It may be possible to gradually eliminate perennial ryegrass from a mixed Kentucky bluegrass and perennial ryegrass stand by using chlorsulfuron at low rates.

*—Dr. Branham*□

## Using non-selective herbicides

Herbicides that kill all vegetation are called non-selective herbicides. These products have become widely used in turf renovation and for edging around trees, hard-to-mow areas, under fences, etc.

Although several non-selective herbicides are available, by far and away the most widely used product is glyphosate (Roundup). It is difficult to imagine a better herbicide for non-selective weed control than this product. It is irreversibly adsorbed to soil particles, and therefore has no soil residual. Therefore, renovation can begin also immediately after application, although time should be given for the glyphosate to translocate throughout the entire plant before beginning any processes that will disturb the vegetation you're trying to control.

Another reason that makes this such a good herbicide is that it is readily translocated in most plants, thus controlling the entire plant-foliage, roots, rhizomes and stolons. It is also an environmentally safe product with very low mammalian toxicity (oral $LD_{50}$ of 5600 mg/kg for rats, which would be considered almost non-toxic).

—*Dr. Branham*□

important component in any turf weed control program.

Without exception, all of the herbicides used in general broadleaf weed control in turf have a similar mode of action. These herbicides, listed in Table 1, all concentrate in the meristematic areas of the plant and cause uncontrolled tissue growth, resulting in a bending and twisting of plant parts (called epinasty) and ultimately the plant's death.

In this category of herbicides is 2,4-D, the oldest organic herbicide known. It was discovered during World War II, has been in commercial use since the late 1940s, and is the most researched herbicide in existence.

The only other turf broadleaf herbicide which is not a growth regulator-type herbicide is bromoxynil (Buctril), which is a photosynthetic inhibitor.

However, bromoxynil was cancelled for use in turf by its manufacturer, Rhone-Poulenc, in 1989 and is currently only labelled for use on sod or grass seed production.

### Broadleaf mixtures

With the exception of MCPP, these broadleaf herbicides are routinely sold in mixtures with 2,4-D being the primary component of most mixes (Table 1).

There are differences in efficacy among the different mixtures. However, the most important factor controlling efficacy is the type of formulation used.

All of the herbicides listed in Table 1 are organic acids and as such can be modified to other forms to improve herbicidal activity. The most common formulations are esters or amine salts. These formulations have a marked effect on the herbicidal activity.

Esters are better at penetrating the plant foliage but they are slightly volatile. The volatility can cause injury to non-target plants if conditions at application favor volatility.

Conditions favoring volatility would include high air temperatures, moderate winds and high relative humidities.

### Evaluating amine salts

Amine salts, on the other hand, are essentially non-volatile but they don't penetrate the plant foliage as readily as esters. Therefore, ester-formulated herbicides are more efficacious than amines on an active ingredient basis, but they can cause non-target plant injury; so caution must be used when employing ester-formulated herbicides.

*One well-timed post-emergence application can result in season-long control, but only if delayed sufficiently to catch germinating plants.*

As a general rule-of-thumb, amine formulated mixtures of 2,4-D, MCPP and/or dicamba will control 90 percent of the broadleaf weed problems found in cool season turf if used properly.

Use in summer will routinely result in reduced levels of control while use of herbicides on drought-stressed weeds can reduce control levels to zero. However, a small number of turf weeds require either an ester-formulated herbicide combination or a herbicide with a different spectrum of weeds controlled. These weeds would include creeping speedwell, ground ivy, prostrate spurge, creeping yellow woodsorrel, wild violets and wild garlic.

Many of the ester-formulated products such as Turflon D, Super Trimec, Weedone DPC and Weedestroy Triester will control these weeds. Good to excellent control of these weeds often requires two applications spaced two to four weeks apart.

The loss of Buctril, a post-emergence broadleaf herbicide, for most turf situations means that on seedling turf, there really is no means of controlling broadleaf weeds.

Buctril could be applied to any size seedlings without injuring the desirable turf. The standard recommendation for controlling broadleaved weeds in seedling turf with phenoxy herbicides is to wait until the turf has been mowed one time before applying a ½x rate of the herbicide.

### Annual grass weeds

Annual grass weeds, most commonly crabgrass, are probably the biggest weed problem most turf managers face.

Because of the large number of viable seeds in the soil and the ability of the grass weed seedlings to effectively compete in a turf stand, weeds such as crabgrass can be difficult to control.

The preferred method to control crabgrass is with a pre-emergence herbicide. However, when these do not adequately control crabgrass, post-emergence herbicides must be used.

Up until 1987, the only available choice to control crabgrass post-emergence was a formulation of methane arsonate such as MSMA or DSMA. These herbicides are sold under a variety of trade names as listed in Table 1. However, in 1987 a new herbicide was approved for use on cool-season turf. This herbicide, fenoxaprop (trade name Acclaim), provides a second option for post-emergence crabgrass control.

### Checking conditions

While MAA compounds can provide effective crabgrass control, generally

Over the years
you paid the price.

You worked
around the problem of a
short supply.

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Now there's a new bentgrass
that's competitive in quality,
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in the past.

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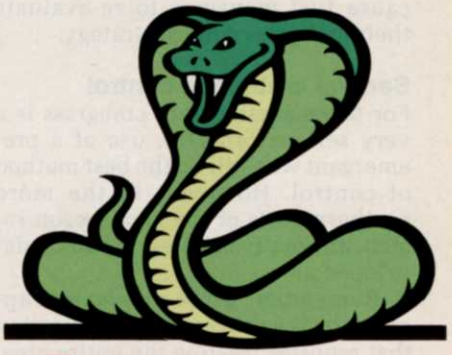

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**TABLE 3.**

**Applications for controlling crabgrass**

| Herbicide | Rate | Date of Application | % Crabgrass 8/27/87 |
|---|---|---|---|
| Acclaim | 0.04 | 5/15 | 41 |
| Acclaim + PreM | 0.04 + 1.5 | 5/15 | 0 |
| Acclaim | 0.06 | 5/15 | 34 |
| Acclaim + PreM | 0.06 + 1.5 | 5/15 | 5 |
| Acclaim | 0.06 | 5/30 | 40 |
| Acclaim + PreM | 0.06 + 1.5 | 5/30 | 2 |
| Acclaim | 0.08 | 5/30 | 23 |
| Acclaim + PreM | 0.08 + 1.5 | 5/30 | 1 |
| Acclaim | 0.08 | 6/15 | 32 |
| Acclaim + PreM | 0.08 + 1.5 | 6/15 | 15 |
| Acclaim | 0.12 | 6/15 | 55 |
| Acclaim + PreM | 0.12 + 1.5 | 6/15 | 5 |
| Acclaim | 0.12 | 6/30 | 3 |
| Acclaim | 0.12 + 1.5 | 6/30 | 1 |
| Untreated | | | 30 |

**Source:** Dr. Branham

two applications 10 to 14 days apart are required for effective control. In addition, these products can be phytotoxic under the hot, humid conditions of summer.

Because of these drawbacks, use of these herbicides was primarily limited to controlling crabgrass that was not controlled pre-emergence. That is, it would be uncommon to use MAA as your only method of controlling crabgrass.

Acclaim offers some interesting possibilities because it is a very effective crabgrass herbicide. On young crabgrass (two tillers or smaller), 95 percent or higher control is often seen.

This product, and others that may be available in future years, should cause turf managers to re-evaluate their crabgrass control strategy.

### Serious crabgrass control

For those areas where crabgrass is a very serious problem, use of a pre-emergent will still be the best method of control. However, in the more northern parts of the cool-season region, alternative strategies can be developed.

Remember, a pre-emergence application is a preventative application that requires treating the entire area. A post-emergence application can be directed on the weedy areas only and thus less total area could potentially require treatment.

For turfs that have not had a history of crabgrass invasion, a strategy of skipping the pre-emergence application and spot treating with a post-emergence product could be employed with a potential for cost savings.

By using a "post"-only application the manager has more flexibility, as was dramatically shown during the drought of 1988. Pre-emergence applications were essentially wasted in 1988 because there was no water available for crabgrass germination. However, once the drought was broken in July, the crabgrass germinated and the pre-emergence herbicide had dissipated, resulting in tremendous crabgrass populations.

*Pre- and post-emergence combinations exemplify the different control strategies that are available.*

These populations had to be treated with a post-emergence application since practically no pre-emergence control was seen. Thus, if you had waited to see the crabgrass problem develop you would have saved the cost of the pre-emergence application and used the post-emergence product to get control.

The advantage of this approach is flexibility and potential cost savings while the drawback is that you must tolerate a certain level of crabgrass before treating.

### Pre-, post- combos

The use of pre- and post-emergence combinations is another example of the different grass control strategies now available.

The data in Table 3 displays some of the results of using pre/post combinations and post-only applications for controlling crabgrass.

The data show that the pre/post combinations are effective and could result in either a lower rate of pre-emergent or elimination of the second pre-emergence application. Also, note that one well-timed post-emergence application can result in season-long control, but only if delayed sufficiently to catch all of the germinating crabgrass plants.

### Nutsedge control

For control of yellow nutsedge, either MSMA or Basagran is effective. However, Basagran is usually preferred because the potential for phytotoxicity is reduced.

Because the root tubers of the yellow nutsedge are not killed by these herbicides, multiple applications are needed to kill the plants sprouting from the tubers.

In essence, you try to prevent the plants from getting enough growth to produce more tubers. Thus, as many as one to three applications per season could be required to eliminate a serious yellow nutsedge problem.

The above summarizes the major types of post-emergence weed control applications. With any post-emergence application, make sure the plants are actively growing and treat them at the proper weed growth stage to achieve effective control. As always, follow the manufacturer's label to assure consistent, safe results. **LM**

Dr. Branham is an associate professor in the Crop and Soil Sciences Department at Michigan State University.

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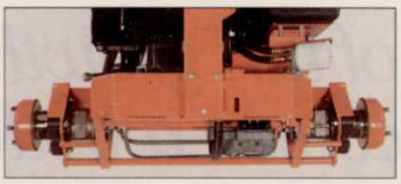

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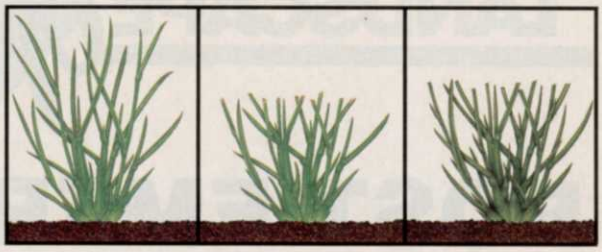

*1.* Sprig of grass in normal state.
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# POST-EMERGENCE WEED CONTROL IN WARM-SEASON TURFGRASSES

There are many ways to control unwanted plants. Just be sure you know what you're treating and don't promise more than can be delivered.

*by Bert McCarty, Ph.D., University of Florida, Gainesville*

Weeds can be defined simply as unwanted plants or plants growing out of place. Therefore, beauty is in the eye of the beholder, meaning that some people simply want ground cover with any green plants—weeds and all.

Others desire a uniform turf stand with no weeds or additional undesirable characteristics, such as damage from insects, diseases, or other pests. For these, weed control is rapidly becoming better defined as "weed management."

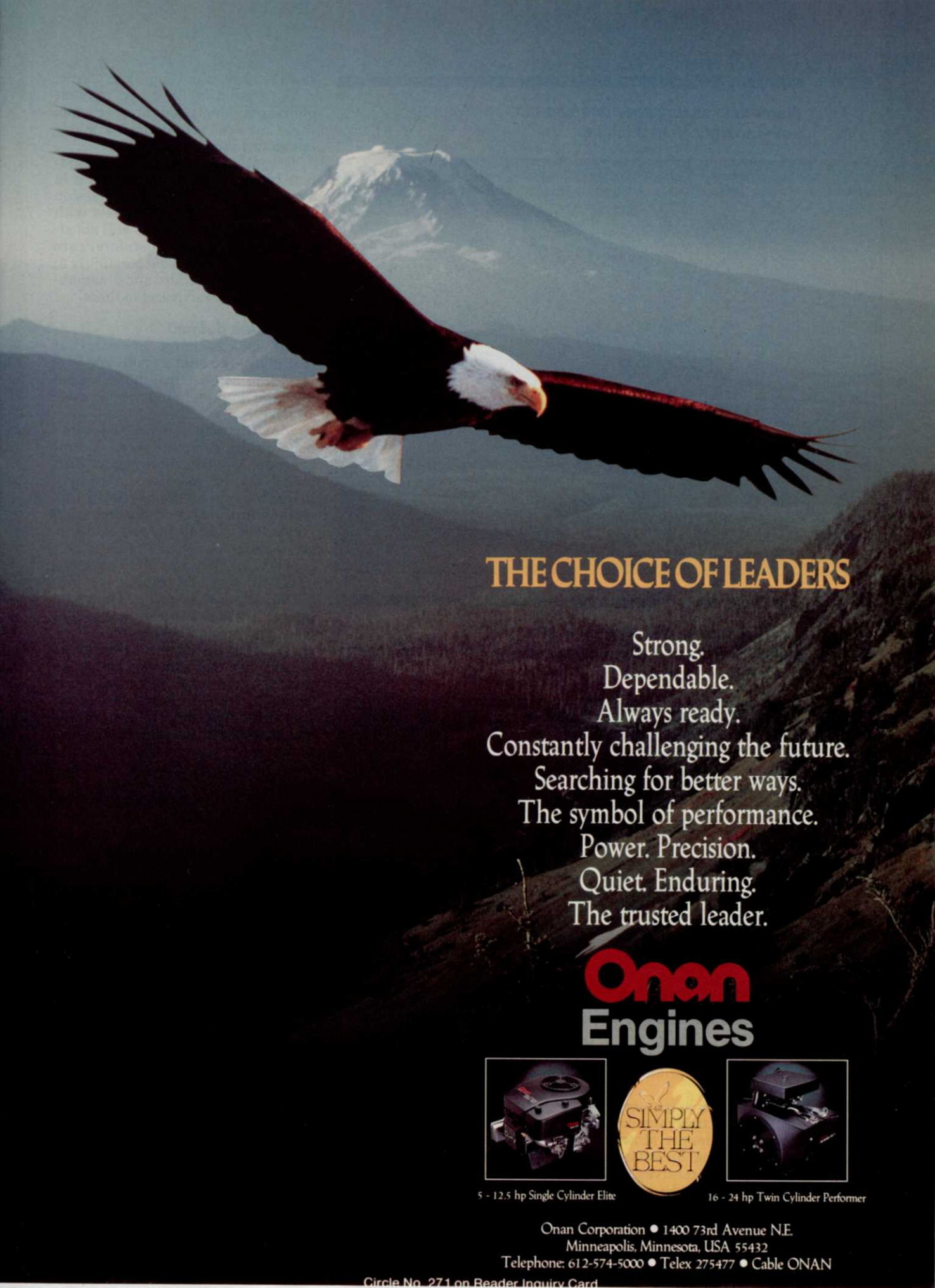
## Weed control methods

Several means of weed control are available. Incorporating as many as possible by turf managers will increase their effectiveness.

Encourage healthy turf growth and be prepared to hand-pull weeds from an area.

If only a few weeds are present, especially in newly-established areas, hand removal is the safest alternative. Obviously, this is practical only on a

**Treat weeds before they begin to tiller or produce seedheads. Otherwise multiple applications of herbicide spaced 7 to 10 days apart are necessary for control.**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## Table 1.

**Warm-season turfgrass tolerance to post-emergence herbicides.**

| Herbicide | Bahia-grass | Bermuda-grass | Carpet-grass | Centipede-grass | St. Augustine-grass | Zoysia-grass |
|---|---|---|---|---|---|---|
| *Postemergence* | | | | | | |
| asulam | D[1] | S-I[2] | D[3] | D | S-I | NR |
| atrazine | I | S-I(D) | I | S-I | S-I | I |
| bentazon | S | S | I | S | S | S |
| 2,4-D | S | S | I | I | I | S |
| 2,4-D + dicamba | S | S | I | I | I | S |
| 2,4-D + dichlorprop | S | S | I | I | I | S |
| 2,4-D + MCPP | S | S | I | I | I | S |
| 2,4-D + MCPP + dicamba | S | S | I | I | I | S |
| 2,4-D + MCPP + dichlorprop | S | S | I | I | I | S |
| dicamba | S | S | I | I | I | S |
| DSMA, MSMA | D | S | D | D | D | I |
| imazaquin | D | S | I | S | S | S |
| MCPA + MCPP + dichlorprop | S | S | I | I | I | I |
| MCPP | S | S | I | I | I | S |
| metribuzin | D | S-I | D | D | D | NR |
| pronamide | NR | S | NR | NR | NR | NR |
| sethoxydim | D | D | D | S | D | D |

[1]S = Safe at labeled rates; I = Imtermediate safety, use at reduced rates; D = Damaging, do not use; NR = Not Registered for use on this turfgrass.
[2]Asulam is labeled for 'Tifway'(419) bermudagrass and St. Augustinegrass.
[3]Carpetgrass tolerance to herbicides has not fully been explored.

## Table 2.

**Common and trade name examples, manufacturers and uses of post-emergence herbicides in warm-season turfgrasses.**

| Common Name | Manufacturer | Trade Name(s) | Uses |
|---|---|---|---|
| asulam | Rhone-Poulenc | Asulox 3.34 lb/gas | Grass weed control in St. Augustinegrass. |
| atrasine | Ciba-Geigy · others | Aatrex · others | Pre and early Post-emergence broadleaf and grass weed control. |
| bentazon | BASF | Basagran 4 lb/gal | Nutsedge (yellow) control. |
| 2,4-D | Dow/Elanco<br>Fermenta<br>Rhone-Poulenc · others | | |
| dicamba · 2,4-D | Sandoz<br>Lesco · others | Banvel 720, Weedmaster<br>Eight-One Selective · others | Broadleaf weed control. |
| dicamba | Sandoz · others | Banvel 4 lb/gal · others | Broadleaf Weed Control. Usually mixed with 2,4-D and other broadleaf herbicides for wider weed control spectrum. |
| dichlorprop · 2,4-D | Rhone-Poulenc | Weedone DPC | Broadleaf weed control. |
| DSMA | Fermenta · others | DSMA Liquid · others | Grass weed control in bermuda and zoysiagrasses. |
| glyphosate | Monsanto | Roundup 4 lb/gal | Non-selective, systemic weed/brush control. |
| imazaquin | American Cyanamid | Image 1.5 lb/gal | Nutsedge (purple) and selective broadleaf weed control in southern turf except bahiagrass. |

small area with only a few weeds present, but may be appropriate for some homeowners.

Mowing at the proper height and frequency will suppress many weeds, especially annual broadleaves. Mowing prior to weed seedhead formation will also reduce soil seed reserves.

Other good housekeeping practices, such as washing mowers after cutting weed-infested areas and maintaining hard-to-mow areas such as fence lines, will help prevent introduction of new seeds. Always incorporate and follow a mowing schedule as suggested by your local extension service.

### Smothering weeds

The use of non-living material to exclude light (smothering) is effective in certain areas such as flower beds, foot paths, or nurseries where turf is not grown. Materials used include straw, sawdust, hay, wood chips and plastic.

Care must be taken to prevent mowing accidents that can arise when these materials move into a maintained turf area.

Recently, several mat-type products impregnated with herbicides to extend the time of weed suppression have been introduced. Contact with these by living plant parts will not allow further growth; therefore, care must be taken to prevent root injury to desirable trees, shrubs, and ornamentals that may be exposed to these.

### Herbicides defined

A herbicide is simply any chemical that injures or kills a plant. For herbicides to be effective, the following decision making sequence is suggested:

**Identification.** This is the backbone of any herbicide weed control program. Identification begins with classifying the weed type. Are they broadleaves or dicotyledonous plants? Broadleaves have two seed cotyledons (young leaves) at emergence and have net-like veins in their true leaves. They also often have colorful flowers. Examples include clover, spurges, lespedeza, plantain, henbit, parsley, beggarweed, matchweed and many others.

Grasses, or monocotyledonous plants, have only one seed cotyledon present when seedlings emerge from the soil. Grasses also have hollow, rounded stems with nodes (joints), and parallel veins in their true leaves. Examples include crabgrass, goosegrass, dallisgrass, thin paspalum and annual bluegrass.

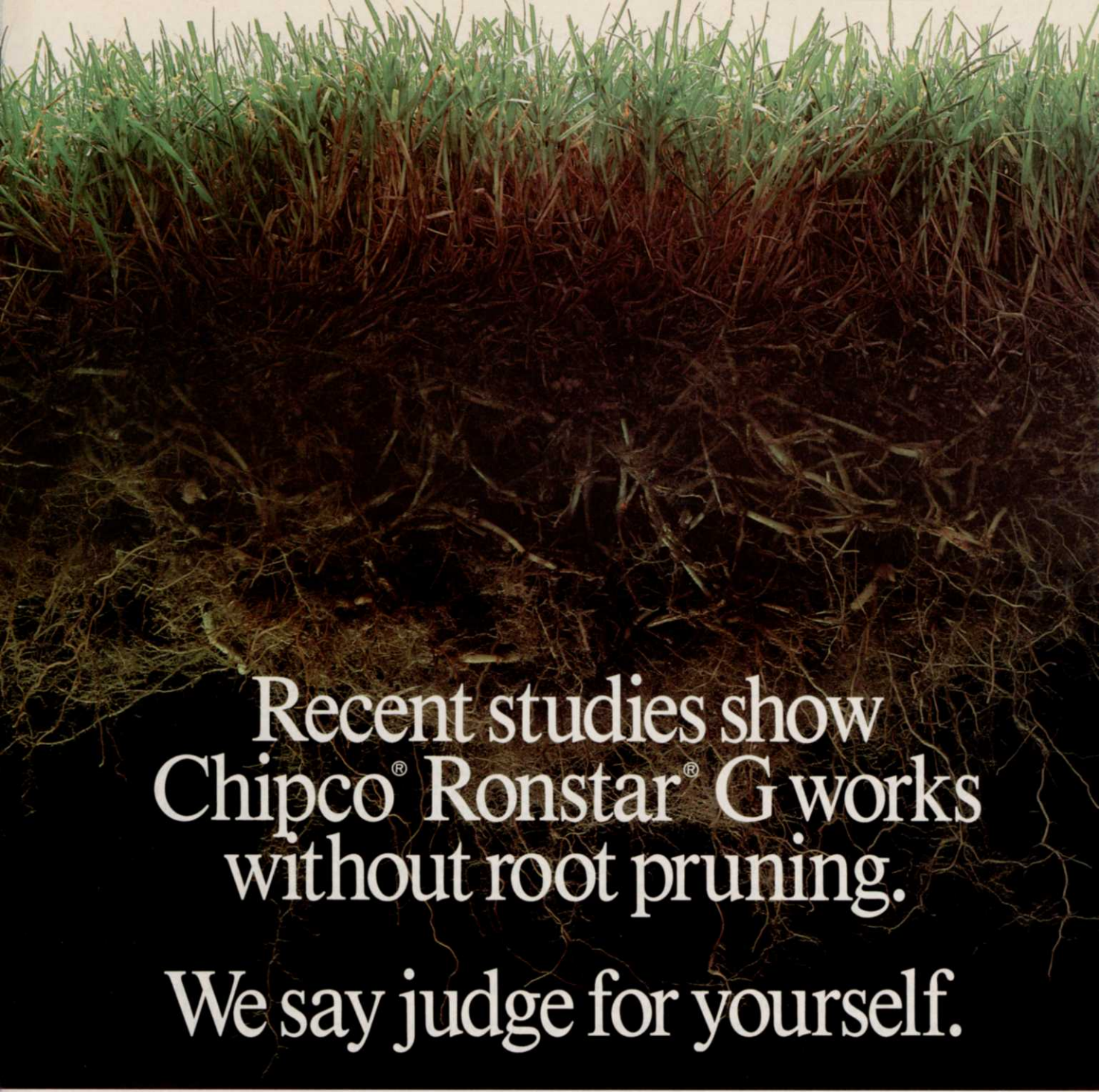
Sedges and rushes generally favor a moist habitat and have either stems that are triangular-shaped and solid (sedges), or round and solid (rushes).

Weeds complete their life cycles in either one growing season (annuals), two growing seasons (biennials), or three or more years (perennials).

Annuals that complete their life cycles from spring to fall are generally referred to as summer annuals, and those that complete their life cycles from fall to spring are winter annuals (summer annual grasses, as a class, are generally the most troublesome in turf).

**Herbicide selection.** Deciding if and which herbicide(s) to use can be confusing. There is, however, a checklist to help make this decision.

After identifying the weed, read the chemical label thoroughly to decide which turf species tolerate exposure to those particular products (Tables 1 and 2 list most common-use turf herbicides, trade name examples, and turfgrass tolerance).



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## Table 2. (cont.)

**Common and trade name examples, manufacturers and uses of post-emergence herbicides in warm-season turfgrasses.**

| Common name | manufacturer | trade name(s) | uses |
|---|---|---|---|
| MCPA | Rhone-Poulenc | Weedar MCPA 4 lb/gal + others | Broadleaf weed control. Usually mixed with other herbicides for wider spectrum of weed control. |
| MCPA + MCPP + 2,4-DP | Riverdale | Weedestroy Triamine II | Broadleaf weed control. |
| MCPP | Fermenta<br>Lesco<br>PBI/Gordon<br>Rhone-Poulenc | MCPP<br>Lescopex 2.5 lb/gal<br>Mecomec 4 lb/gal<br>Weedone MCPP Turf Herbicide | Broadleaf weed control. Usually mixed with other herbicides for wider spectrum of weed control. |
| MCPP + chlorflurenol | Ortho | Weed-B-Gon for Southern Lawns | Selective broadleaf weed control. |
| MCPP + 2,4-D + dicamba | PBI/Gordon<br>Lesco<br>Sierra + others | Trimex Southern<br>Three-Way Selective<br>Trex-San + others | Wide spectrum broadleaf weed control. |
| metribusin | Mobay | Sencor 4L, 50W, 75DF | Mixed with MSMA/DSMA for goosegrass control in bermudagrass. |
| MSMA | Fermenta<br>Helena | Bueno 6 lb/gal<br>MSMA 6 lb/gal | Grass weed control in bermuda and zoysiagrasses. |
| paraquat | ICI Americas | Gramoxone | Non-selective, contact weed control. |
| pronamide | Rohm & Haas | Kerb 50WP | *Poa annua* control in bermudagrass. |
| sethoxydim | BASF | Poast 1.5 lb/gal | Grass weed control in centipedegrass. |
| simazine | Ciba Geigy + others | Princep 4 lb/gal, 80WP + others | Pre and early Post-emergence grass and broadleaf weed control. |
| triclopyr + 2,4-D | Dow/Elanco | Turflon-D | Broadleaf weed control. |
| triclopyr + clopyralid | Dow/Elanco | Confront 3 lb/gal | Broadleaf weed control. |

**Source:** Dr. McCarty

**WARM** *from page 46*

Next, look at one of the numerous publications available that list the susceptibility of the weeds to the herbicide in question.

Reread the label to learn everything possible about a product. Information includes: site of uptake (foliar, root, or both); length of effectiveness; effects of UV light; effects of water pH on the product; whether it can be tank-mixed with fertilizer, insecticides or other herbicides; whether a surfactant is needed, etc.

Other information on the label includes safety precautions, effects on surrounding (non-target) plants, overseeding or replanting waiting periods, and environmental influences (such as rainfall) on control.

Manufacturers invest millions of dollars and many years of research and development on each product, and the label reflects their findings. Always read and follow these before use.

**Herbicide application.** Proper application is the last link in the chain of successful herbicide use. Misapplication and/or the use of wrong materials are the main reasons for most weed control failures.

Equipment calibration and proper coverage are two important factors in correct application procedures. For those using tractor-mounted or pull-behind sprayers with a boom of constant width, equipped with nozzles that produce a constant flow rate at a given pressure, moving over open terrain, calibration is fairly straight forward. However, LCOs often use a handgun. In using this method, one is sure of only one variable—the volume of water being applied, assuming the pump and regulator are constant.

One suggestion for handgun use is that you calibrate every applicator separately. Individuals do not walk or use the same swing pattern (motion) exactly alike. Other suggestions:

- limit overlap;
- emphasize the importance of maintaining consistent walking speed and overlap each day;
- check regularly that the nozzle output, pump pressure, and engine speed are similar as when calibration was performed;
- and don't mow treatment areas for two to four days before or after application. This delay will allow time for herbicide penetration and translocation throughout the weeds before mowing.

### Post-emergence herbicides

Post-emergence herbicides are generally effective only for weeds that have emerged (are visible). Post-emergence herbicide effectiveness is reduced when the weed is under drought stress, has begun to produce seedheads, or is mowed before the applied chemical has had time to work.

Post-emergence herbicides should never be applied when temperatures are hot (>85°F), unless some degree of turf discoloration is acceptable.

Many turf managers wait until weeds become mature before applying post-emergence herbicides. By waiting this late, multiple applications (2 to 3) spaced 7 to 10 days apart are necessary for control, though this increases the probability of damaging the turf.

Generally, the younger the weed, the easier it will be controlled. Try to treat weeds when they are at the 2 to 3 leaf growth stage (Figure 1). Don't wait until it begins to tiller or produce seedheads (Figure 2). Waiting this late will usually result in reduced control.

### Broadleaf weed control

Most broadleaf weeds are controlled with atrazine and/or various combinations of 2,4-D, MCPP, MCPA, dicamba, or triclopyr. It is suggested for young broadleaf weed control in St. Augustine, centipede, and zoysiagrasses that atrazine be used.

For weeds that escape control, follow-up with a treatment consisting of dicamba and 2,4-D.

For best control, the weeds should be actively growing and not under moisture stress. Control may be reduced if weeds are not actively growing due to less herbicide uptake and translocation by the plants.

For the more difficult-to-control broadleaf weeds, two applications of 2,4-D, dicamba, MCPP and/or triclopyr, spaced 7 to 10 days apart, are required. However, repeat applications also increase the chance of damage to the turfgrass. In these cases, using one-half the normal herbicide rate will reduce turf injury.

It is suggested that one-half the normal rates of 2,4-D and/or MCPP never be exceeded on St. Augustinegrass.

### Grass weed control

Atrazine applied early as a post-emergent will provide fair control of many annual grass weeds and also provide good to excellent control of broadleaf weeds.

For older weeds in bermudagrass and zoysiagrass, repeat applications of DSMA/MSMA are necessary.

On centipedegrass, Poast will provide good to excellent control of most annual grass weeds. In St. Augustinegrass, Asulox provides fair to good control of some annual grasses.

Repeat applications are usually necessary but this increases the risk of turf injury, especially if the turf is treated when temperatures are hot or under moisture stress.

*continued on page 50*

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## Don't underestimate proper agronomic practices

The first and most important strategy in weed management begins with proper agronomic practices, which encourage a dense, growing turf.

A healthy, dense turf serves several important roles in weed management. The first is that turf shades the soil so sunlight can not reach the soil surface. Sunlight reaching the soil will warm the surface quicker, resulting in earlier spring seed germination.

Second, many weed seeds require a certain quantity and quality of sunlight for optimum germination. Therefore, dense turf minimizes sunlight penetration to the seed. Dense turf also minimizes the physical space available for weeds to become established.

When turf is not present, Mother Nature quickly fills bare ground with plants in an attempt to minimize soil erosion. A race begins between her and the turf manager as to who can fill the weakened turf areas first.

Steps for proper turf management involve the following:

**Turf managers must decide which turf variety is best adapted for a particular area or use.** For example, bermudagrass has very poor shade tolerance. Therefore, it will become too thin after being planted under these conditions. This thinning allows the opportunistic weeds to become established.

**Proper turf cultural practices such as fertilizing, watering, and mowing.** These practices are necessary to encourage healthy growth. For example, if a turf area is over-watered or fertilized, or mowed too low or too infrequently, it is usually weakened (thinned) and weed encroachment results.

**Traffic control.** Areas constantly damaged or compacted by traffic usually result in thin turf, allowing weeds to become established. Goosegrass, annual bluegrass and certain sedges are examples of weeds that tend to thrive in compacted or continuously wet soils.

**Other pest control.** Turf weakened by other pests such as insects, diseases, and nematodes often cannot recover quick enough to out-compete weed encroachment. Soil disturbances, such as mole cricket tunneling, also expose additional weed seeds, and therefore add another avenue for establishment.

—*Dr. McCarty*□

**Post-emergence herbicides are generally effective only for weeds that have emerged, and are less effective when the weed is under heat or drought stress.**

**WARM** *from page 48*

Currently there are no selective weed controls available for bahiagrass used in the landscape.

### Nutsedge control

Nutsedges, as a class, are very difficult to control, especially in wet areas. Many sedges produce numerous tubers, rhizomes and/or seed which provide reproductive means long after the mother plant has died.

Atrazine will provide fair to good control of several annual-type sedges if treated when the weeds are just emerging. Yellow nutsedge is best controlled with Basagran while purple nutsedge is best controlled with Image.

Repeat applications will be necessary for complete control and treatment for several consecutive years may be necessary for long-term control.

### Record-keeping

Environmental stresses (heat, drought, cold, shade) can have an effect on the amount of material absorbed by the plant and its effectiveness. It is suggested that the environmental conditions at the time of application be recorded, in the event failure occurs, or to more accurately evaluate effectiveness.

These variables include air and soil temperatures, relative humidity, wind speed and direction and leaf and soil moisture.

Other discussions between you and your client should include explaining the strengths and weaknesses of herbicides being considered and which (if any) weeds you do not feel will be controlled.

No one herbicide can control all weeds, so it must be decided if more than one material should be used.

Outline your strategy (program) to your client. Explain when and how treatments will be made, what can be expected (percenatge of control) from these, how long it takes for weed mortality, and who is responsible for proper cultural practices (i.e., watering, mowing, fertilizing, etc.) following treatment.

Finally, do not promise more than can be delivered. Every operation has its limitations, and promises that exceed these usually result in repeated callbacks and cancellations.

Remember, weed control begins with proper turf management, and without this, herbicides are only a temporary fix. **LM**

Dr. McCarty is assistant professor and turf and weed specialist at the University of Florida in Gainesville.

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With virtually endless varieties of colorful woody ornamentals now available in nurseries, many landscapers are purposely creating Dyclomec-safe beauty spots such as the one above. Photos on the right show how Dyclomec can turn a fence line into a landscaping highlight.

# How to improve your efficiency in managing landscape beauty spots

**Nothing says as much about a landscaper's expertise as the appearance of ornamental beds, fence lines, tree wells, etc. Learn how Dyclomec® Landscaping Herbicide can help keep these beauty spots weed-and-grass-free for considerably less money than you are now spending.**

In recent years, the usage of Dyclomec has increased at an unprecedented rate as more and more landscapers have learned from direct experience what a labor-saving, cost-saving chemical tool it is.

And now, it is your turn to discover how you can use Dyclomec to keep problem areas such as fence lines, tree wells, ornamental beds, etc. free from weeds and grasses. Of course, you know how important this is, because the most neatly manicured turf and beautifully trimmed ornamentals are wasted if your landscaping highlights are spoiled by an ugly growth of weeds and grass.

Perhaps you've tried a contact herbicide only to find that the vegetation grows right back. Perhaps you've tried a flower-safe pre-emerge, only to find that it runs out of gas long before the season is over, and that its narrow spectrum misses the very weeds and grasses you need to control.

**Broad-spectrum strength.** In desperation you may have gone back to your string trimmer and a hoe. But cheer up — because this is the year you discover Dyclomec.

Indeed Dyclomec's active ingredient is unique in all the world. No other chemical is so versatile and so helpful to the landscaper.

It's *both* post-emerge and pre-emerge; it controls *both* grasses and broadleaves, even such toughies as quackgrass and spurge; it controls *both* annuals and perennials; it has the broadest spectrum of any pre-emergent in the world; one treatment lasts all season and then totally biodegrades.

### What is Dyclomec — how does it work?

The active ingredient in Dyclomec is dichlorobenzonitrile. We mill it into razor-thin crystals and incorporate it into a special granule that our researchers developed in 1985.

You simply spread the granules on any precise area you want to keep clean. You can put the granules down over existing weeds and grasses or you can put them down over

# Schematic drawings show why Dyclomec works where conventional (flower-safe) pre-emerges fail.

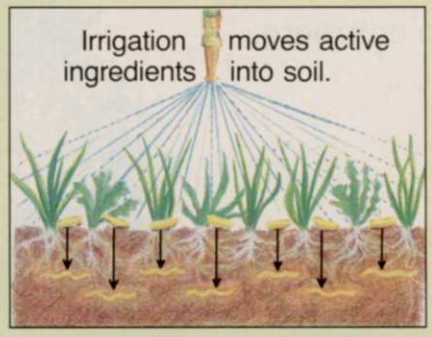
Flower-safe pre-emergent herbicides in some instances have to be present in adequate strength before germination occurs. Such herbicides simply will not knock out weeds after they germinate.

Furthermore, these flower-safe pre-emergents are broken down by light and microbial action and thus begin to lose strength from the very first day they are applied.

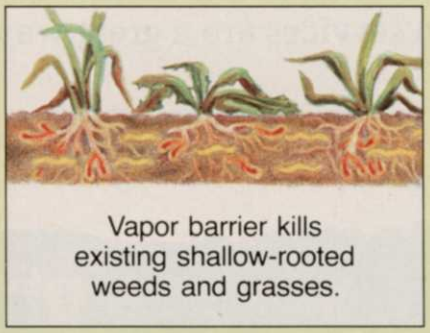
Seeds, of course, can germinate almost anytime during the year, depending on the weather and the weed or grass species. Thus it is that many seeds can germinate past the efficiency period of the pre-emerge — or could have germinated before the pre-emerge is applied. It's a narrow window at best, and characteristically the spectrum of a pre-emerge that stops germination is relatively limited.

Of course, these flower-safe pre-emergents have no effect at all on existing weeds (that's why it's safe to spray them over flowers). Accordingly, to clean up a landscape beauty spot, it is necessary to kill existing vegetation with a contact herbicide. Or clean it out by hand.

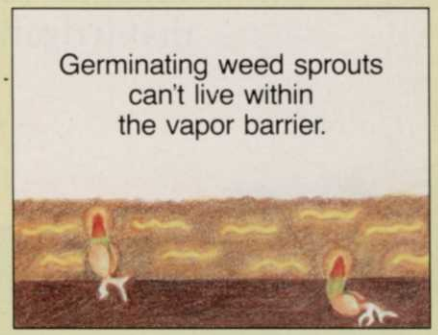
Now ... take a minute to study the schematic drawings on this page that delineate the remarkable activity of Dyclomec ... then, as a professional, ask yourself if you shouldn't at least give Dyclomec a trial.



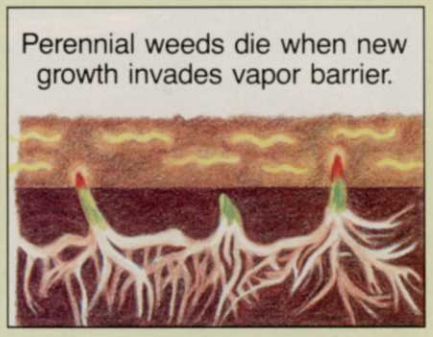

Dyclomec granules are spread in areas you wish to keep clean from weeds and grasses. It is all right to spread them over existing vegetation if you want to kill it. Water moves the active ingredient into the top 2 or 3 inches of the soil, where it forms a vapor barrier that kills meristematic tissue.



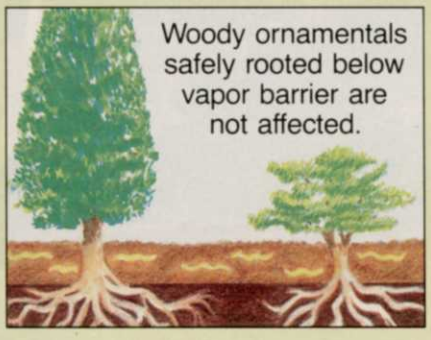

Dyclomec kills all existing weeds and grasses because their tender roots are in the vapor barrier. Even such toughies as quackgrass, crabgrass, Bermudagrass, spurge, oxalis and ground ivy will die when their roots are exposed to the Dyclomec vapor barrier, resulting in beautifully weed-free grounds all season long.



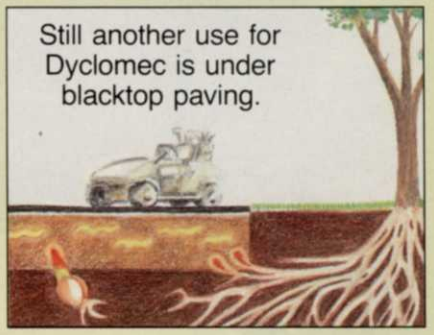

Weed seeds either in or below the vapor barrier cannot emerge because the barrier kills their meristematic tissue. And, since Dyclomec gives season-long control, there is no critical time table as to when it must be applied. Do it at your convenience, confident that the treatment will be effective.




Perennials coming out of dormancy die when their new sprouts hit the barrier. Likewise, creeping grasses like Bermuda are pruned back when they try to invade the vapor barrier. So long as the Dyclomec vapor barrier is present, you can be sure that the area is going to be free of weeds and grasses.




Woody ornamentals that have roots below the vapor barrier are unaffected. Because of this, many landscapers deliberately plan their "beauty spots" to contain colorful, woody ornamentals that are Dyclomec-safe. The overall beauty is enhanced and the maintenance cost is reduced.




Blacktop cart paths that are underlaid with Dyclomec will not have weeds poking through their surface nor shallow roots invading from below and threatening to buckle the blacktop. Of course, this is also true of areas that are covered with gravel or pebbles, or even cobblestones or bricks.

bare ground, or bark, or mulch or pebbles. The herbicide can work its way down through any kind of groundcover that weeds can work their way up through. All you need to do is be sure it is incorporated into the soil. So, in most instances, the best thing to do after spreading it is to sprinkle it in with irrigation.

The herbicide will penetrate into the top layer of soil and form a vapor barrier approximately 2 to 3 inches deep. This vapor barrier is not water soluble so it has very little lateral movement.

The vapor barrier kills meristematic tissue, and thus no shallow-rooted plants can live in it. No newly germinated seeds can live in it, and no perennial shoots coming up from dormancy can penetrate it. And yet existing, deep-rooted woody ornamentals are completely safe.

And here's the really good news! It lasts all season long, and then totally biodegrades.

If you have any questions or would like more information, please call our Sales Service Department.
**Call toll-free, 1-800-821-7925.**

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# DYCLOMEC®

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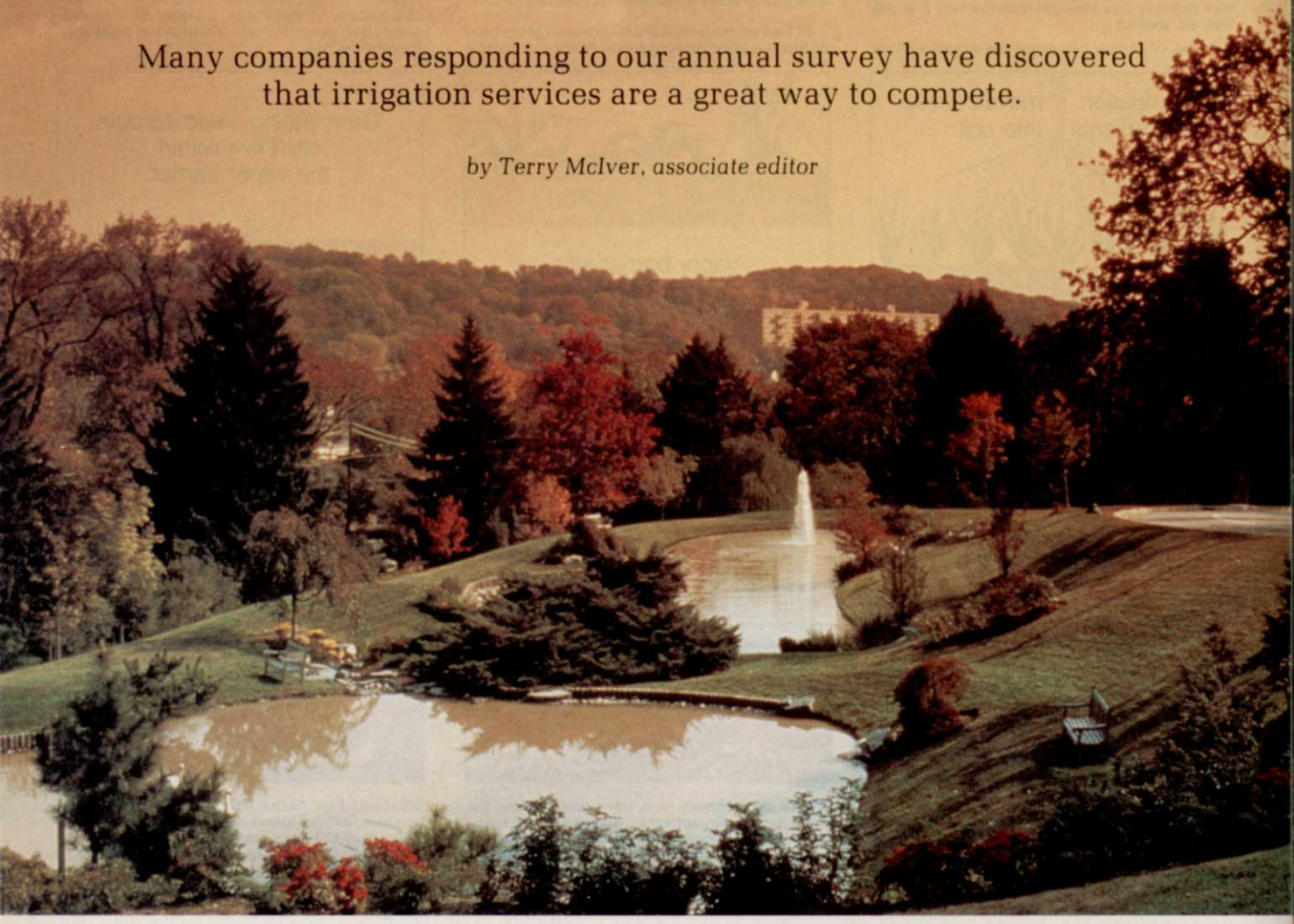
719-289

# TOP 50 LANDSCAPERS

# THE WATER'S FINE!

Many companies responding to our annual survey have discovered that irrigation services are a great way to compete.

*by Terry McIver, associate editor*



Many landscaping companies ventured further into the realm of full-service by adding irrigation installation to their arsenals during 1989. Benefits cited by company spokespersons responding to LANDSCAPE MANAGEMENT's fourth annual survey of contractors include more income and less of the hassles often associated with subcontracting.

A full-time irrigation technician post was added to Four Seasons Landscape in Sacramento, Ca. Pete Bowman, operations manager, says the extra expertise generated revenue and helped improve maintenance.

"His duties include all irrigation troubleshooting, such as a valve that doesn't work, or a clock in need of repair or replacement."

Mark Cetnor of Scandia Landscaping, Livonia, Ill.: "We added an irrigation service a year ago. This year it was fully operational, and it went smoother. It complements our work when we're doing landscape construction; the service can be operated independently (of other services)."

## Who they are

The following are the Top 50 landscape contractors in the U.S., based on gross sales of those companies which responded to our survey:

**1. Tropical Plant Lenders,** Riverwoods, Ill., reported gross sales of $40 million. That's a $5 million increase for Tropical, thanks to the efforts of 900 yearly employees stationed at 10 branch offices. Tropical's maintenance contracts for 1989 surpassed the 10,000 mark.

(Last year's top company, **Environmental Industries,** of Calabasas, Calif., failed to respond to this year's survey.)

**2. Carlacio Landscape, Inc.,** Fullerton, Calif., had $22 million in gross sales. Carlacio's gross sales were $4 million higher than they were in 1988. The company employed 240 peak season employees at four branch offices. They worked on three design/build jobs and six maintenance contracts.

**3. Landscape Specialists, Inc.,** of El Toro, Calif. takes the number three position in its first year in the survey. The company recorded gross sales of $18 million for landscape design, build and maintenance. It completed 90 design/build jobs and fulfilled 61 maintenance contracts.

## MANPOWER CONCERNS REMAIN

Finding qualified labor was the biggest concern of the large landscaping companies we surveyed.

Thirty-eight percent of respondents have trouble finding and keeping people who are willing to work.

"We get people who work for a few days, and you never see them again," says one landscaper. "And salary-wise, we're a little bit higher than others around here. We start a guy at $18,500. In my opinion, people don't want to do this work."

Scott Plein, president of KT Enterprises, is concerned about "the environment, and what type of approach our industry takes toward our interaction with and ability to affect our natural surroundings. Hopefully," says Plein, "we will be pro-active in dealing with such issues and be at the forefront of developing more logical, sensitive controls and more responsible methods for solid waste disposal."

Other respondent concerns included the high cost of health insurance and workmen's compensation, softness in the construction industry, and dangerously low bids by some contractors.

Most vocal about the issue of undercutting was Mark Yahn, president of Ground Control Landscaping, in the "fiercely competitive market" of Orlando, Fla.

"Contractors must learn to bid responsibly for their own financial well-being as well as that of the industry," warns Yahn. "It does little good to take premium jobs out of the market if the final result is conflict with the owner and no profit; or, in some cases, red ink. Wake up, guys!"

Regarding another key financial development originating from the nation's capitol, James H. Taylor, president of Taylor Made Landscaping, Farmingdale, N.J. relates that, "Most of us landscape contractors work with builders, and builders account for a substantial part of our volume, especially as it relates to design/build. During the last couple of months, due to the new laws affecting banks, we have found that our largest customers have been unable to make payments as it relates to their balances. This is apparently because of the banks' new guidelines. They have not advanced monies that had previously been permitted.

"The new laws as they relate to banking and the reevaluation of the real estate market," says Taylor, "have created a situation in which a lot of trades are looking at very bleak conditions as they start the 1990 season. I don't know who to blame: the banks, the builders, or both."

*—Terry McIver*□

**4. American Landscape, Inc.,** of Canoga Park, Calif., had gross sales of $13.5 million, an increase of $1.9 million from 1988. The company has one branch office, and employs 250 peak season workers. The company completed 106 design/build jobs and 178 maintenance contracts.

**5. The Bruce Co. of Wisconsin, Inc.,** Middleton, Wisc., posted gross sales of $13.2 million, a $2.2 million gain over 1988. Its 370 peak season/210 yearly workers completed 500 design/build jobs and 50 maintenance contracts.

**6. ISS Landscape Management Services,** Tampa, Fla., and **Lancaster Landscapes,** Alexandria,Va. recorded gross sales of $13 million. Landscape Management services completed 10 design/build jobs and 250 maintenance contracts. The company operates 9 satellite offices and employs 325 yearly/425 peak season workers.

Lancaster employs 650 peak/325 yearly workers. Design/build jobs totaled 45; maintenance contracts totaled 280.

**8. Landscape Contractors of Illinois, Inc.,** Bartlett, Ill., tallied $12.5 million in gross sales, a $2.5 increase. The company employs 320 peak and 40 yearly employees. Design/build jobs totaled 100; maintenance contracts totaled 48 in 1988.

**9. De Laurentis Construction Co.,** Mamaroneck, N.Y. reported gross sales of $12 million. De Laurentis Construction Co. employs 120 peak employees, doing site work as diverse as excavating, blasting, grating and landscaping.

**10. Chapel Valley Landscape Company** of Woodbine, Md. and **Ruppert Landscape Co.** of Ashton, Md. (tie). Both had gross sales revenue of $10.5 million. Chapel Valley employs 150 peak and 100 annual employees for 115 design/build jobs and 60 maintenance contracts. It has two branch offices. Ruppert Landscape Co. completed approximately 100 design/build jobs and about 100 maintenance contracts, with 215 peak/175 year-round workers out of one satellite office.

**12.Big Pine Farm,** Marietta, Geo. grossed $10.3 million in sales for the year. The company operates two branch offices and employs 96 yearly workers.

**13. Green Thumb Enterprises, Inc.** of Sterling, Va. and **Randall & Blake, Inc.** of Littleton, Colo. (tie), each with $10 million. Green Thumb completed 50 design/build and 180 maintenance contracts with 250 peak and 150 yearly employees. It was also ranked 316 in the *Inc.* magazine Top 500 list of national companies. Randall & Blake, Inc. has two satellite offices. It employs 150 peak and 100 annual workers. Design/build jobs totaled 150; maintenance contracts totaled 35.

**15. Greenleaves,** of Chamblee, Geo. had estimated gross sales of $9 million. The company operates two satellite offices, employing 325 peak and 200 year-round people. It predicted completing 130 design/build and 90 maintenance contracts by year's end.

**16. KT Enterprises, Inc.,** Chantilly, Va., $9.4 million on 194 design/build and 396 maintenance contracts. KT employs 350 peak and 120 yearly workers. The company has two satellite offices.

**17. Johnson Hydro Seeding Corp.,** Rockville, Md. Johnson tallied $7.713 million throughout seven satellite offices. The company completed 160 design/build projects during 1989, and fulfilled 320 maintenance contracts. Johnson employs 140 peak employees, 40 year-round.

**18. Edmund M. Hayden, Inc.** of Woodstock, Ill. estimated gross sales for landscape design, build and maintenance in 1989 at $7.5 million. Hayden employs 30 year-round and 125 peak season workers.

**19. Southern Tree & Landscape Companies,** Charlotte, N.C. Southern Tree earned $7.4 million on 325 design/build jobs and 65 maintenance contracts. The company operates three satellite offices and employs 110 employees year-round.

**20. Hawkins Landscape Co.,** Dallas, Texas, and **Heyser Landscaping, Inc.** of Norristown, Pa. (tie) with gross sales of $7.3 million. Hawkins completed 15 design/build jobs and six maintenance contracts. It employs 165 peak season workers, and 115 year-round. Heyser completed 13 design/build jobs and 164 maintenance contracts. Heyser employs 237 peak, and 83 yearly workers.

**22. Four Seasons Landscape and Maintenance, Inc.** of San Jose, Calif., and **Maintain, Inc.** of Dallas, Texas (tie) with estimated gross sales of $7 million. Four Seasons derived its sales from more than 300 maintenance contracts. It em-

ploys 230 workers at peak season, and 210 year-round employees, from a main office and three satellite offices. Maintain, Inc. completed 20 design/build jobs and fulfilled 300 maintenance contracts in 1989. The company has one satellite office, but employs 285 peak and 170 yearly workers.

**24. Gibbs** of Smyrna, Geo. estimated gross sales for landscape design build and maintenance at $6.7 million. Design/build jobs totaled 150. Maintenance contracts numbered an impressive 500. The company employs 105 peak and 125 yearly workers.

**25. Rood Landsape Co., Inc.**, Tequesta, Fla. totaled $6.6 million in gross sales from 260 design/build jobs and 164 maintenance contracts. The company's 160 peak season and 140 yearly employees operate out of one main office.

**26. Alfred L. Simpson & Co., Inc.**, Atlanta, Ga. had gross sales of $6.5 million from 25 design/build jobs and 150 maintenance contracts. A main office and three satellite offices employ 150 peak and 130 year-round workers.

**27. Chalet Nursery & Garden Shop**, Wilmette, Ill. earned $6.3 million in gross sales from an impressive 1,470 design/build jobs and 300 maintenance contracts. That work is performed by 135 peak-season and 50 year-round employees.

**28. Larchwood Construction Corp.**, Holtsville, N.Y. posted gross sales of $5.5 million with 55 design/build projects and 6 maintenance contracts. It employs 70 peak-season workers and 15 year-round.

**29. Clarence Davids & Sons, Inc.** of Blue Island, Ill. posted gross sales of $5.26 million from 250 design/build projects and 150 maintenance contracts. The company's staff totals 130 during peak season and 35 all year long.

**30. AAA Landscaping** of Tucson, Ariz. completed 67 design/build projects and 265 maintenance contracts in 1989, for total gross sales of $5.2 million.

**31. Hillenmeyer Nurseries** of Lexington, Ky. boosted sales by $1.5 million to $5 million, from more than 50 maintenance contracts. The company employs 150 peak-season and 100 annual workers.

**32. Designs by Lee, Inc.** of Stamford, Conn. and **Scapes, Inc.** of Marietta, Ga. (tie) with $5 million in estimated gross sales. Designs by Lee completed about 200 design/build projects and 25 maintenance contracts. Scapes completed 42 design/build projects and 37 maintenance contracts.

**34. AAA Lawn Industries, Inc.** of Tucker, Ga. posted sales of $4.9 million from 30 design/build projects and 140 maintenance contracts. The company employs 120 peak and 80 yearly workers.

**35. Torre & Bruglio Landscape**, Mt. Clemens, Mich. estimates gross sales at $4.7 million. Ninety peak-season and 20 yearly employees completed 150 design/build jobs and 80 maintenance contracts in 1989.

**36. J. Farmer & Co., Inc.** of Middleton, Mass.; **Dennis' 7 Dee's Landscaping** of Portland, Ore.; **Ground Control Landscaping, Inc.** of Orlando, Fla.; **Davis Landscape Contractors** of Harrisburg, Pa. (Tie).

Farmer & Co. completed 67 design/build projects. Dennis' 7 Dee's somehow managed to complete 2500 design/build projects and 385 maintenance contracts. Ground Control completed 33 design/build jobs and 72 maintenance contracts. Davis completed 20 design/build and 60 maintenance projects.

**40. Varsity Sodding Service** of Swoyersville, Pa. and **Landscape Technologies** of Clearwater, Fla. (tie) with $4.3 million in estimated gross sales. Varsity completed 10 design/build projects and 70 maintenance contracts. Landscape Technologies completed 100 design/build jobs and 14 maintenance contracts.

**42. Amlings Landscape Co.**, Hinsdale, Ill., grossed $4.2 million from 168 design/build jobs and 628 maintenance contracts.

**43. Robert W. Childs Landscape Contractors, Inc.**, of Arnold, Md. recorded gross sales of $4.1 million via 165 design/build jobs and 35 maintenance contracts.

**44. Doerler Landscapes** of Lawrenceville, N.J., **North Haven Gardens** of Dallas, Texas and **Allen Keesen Landscape, Inc.** of Denver, Colo. (tie) each did $4 million worth of business.

**47. Batista Landscape Service, Inc.** of Redwood City, Calif., **New England Horticultural Services** of Milford, Conn.,and **McDugald-Steele** of Houston, Texas (tie) all grossed $3.5 million for 1989. Batista's streamlined operation employs 6 yearly workers and about 30 during peak season. They completed 6 design/build jobs and 15 maintenance contracts.

New England Horticultural Services completed 48 design/build jobs and 337 maintenance contracts. Its total work force during peak season is about 150; annually, the company employs between 40 and 60 workers. McDugald-Steele completed 120 design/build jobs and 65 maintenance contracts. It employs 75 peak-season workers and 55 throughout the year.

**50. Outside, Unlimited, Inc.**, Lutherville, Md., recorded estimated gross sales of $3.2 million on 60 design/build projects and 12 maintenance contracts. Thirty-two peak-season and 24 year-round employees are headquartered in one main office. **LM**

## THE BEST OF THE REST

The following is a list of companies surveyed with estimated gross sales between $1 million and $3.2 million:

**Acres Enterprises**, Wauconda, Ill.
**Arbor Heights Nursery, Inc.**, Webster, N.Y.
**Bland Bros., Inc.**, West Jordan, Utah
**BGT Landscape Co.**, Inc., Mundelein, Ill.
**Bregenzer's, Inc.**, Alpharetta, Ga.
**Control Environmental**, Somerset, N.J.
**ChemTurf/Astin-Russell, Inc.**, Norcross, Ga.
**Clean Cut, Inc.**, Austin, Texas
**Earth Tone Development**, Houston, Texas
**Evergreen Services Corp.**, Bellevue, Wash.
**Four Seasons Lawn & Landscape**, Parkville, Mo.
**Greater Detroit Landscape Co.**, Warren, Mich.
**Greathouse Landscape Co., Inc.**, Nashville, Tenn.
**Green Carpet Landscape, Inc.**, Worcester, Mass.
**Greenland Landscaping Co., Inc.**, Paramus, N.J.
**Hively Farm & Nursery, Inc.**, Dover, Pa.
**Hunt & Hulteen, Inc.**, Brockton, Mass.
**JBK Landscape, Inc.**, Aurora, Colo.
**L&L Landscape Services, Inc.**, Santa Clara, Calif.
**Marvin's Garden & Landscape Service, Inc.**, Sarasota, Fla.
**Mill Bros. Landscape & Nursery, Inc.**, Fort Collins, Colo.
**Pennink Arrimour**, Bryn Athyn, Pa.
**R.M. Landscape Industries, Inc.**, Hilton, N.Y.
**Scenic Landscaping, Inc.**, Hohokus, N.J.
**Scian's Landscaping, Inc.**, Berlin, N.J.
**Skandia Landscaping, Inc.**, Livonia, Mich.
**Smallwood Landscaping, Inc.**, Naples, Fla.
**SKB Lawn Industries, Inc.**, Clarkston, Ga.
**Starwood, Inc.**, Darlington, S.C.,
**Suburban Landscape Associates, Inc.**, Davenport, Iowa
**TerraScaping, Inc.**, Birch Run, Mich.
**Virginia Turf Management Assoc., Inc.**, Norfolk, Va. □

# New 8x8 torque converter transmission gives you the speeds you need

With eight forward and eight reverse speeds, Ford C-Series tractor loaders don't miss a thing! You get exactly the speed you want for loading, grading, tilling, mowing, raking, seedbed preparation and roading.

The new eight-by-eight fully-synchronized, power-reversing torque converter transmission creates its own world. It's coupled with a 540-rpm independent PTO to make more efficient use of power for a wider range of work.

**More speed selection**

For rototilling you get a ground speed under 1.5 mph. Three speeds between three and six mph for grading, loading and mowing. And a top speed near 20 mph gets you down the road fast.

**Smooth direction changes**

For fast, efficient loading and grading, a smooth electric forward-to-reverse powershuttle allows you to change directions without clutching or stopping. If you want to hold a constant ground speed, just engage the electro-hydraulic torque converter lockup. It forms a solidly-coupled driveline so constant ground speed is maintained for mowing, tilling or fine grading.

Want more versatility? You can turn your tractor into a backhoe loader in a matter of minutes with the Model 764 backhoe attachment. It has a digging depth of ten feet, eight inches, and more than five tons of bucket digging force.

Often, buying the right tractor loader comes down to choosing the right features. Your Ford New Holland dealer has more to offer. He's listed in the Yellow Pages under "Contractor's Equipment & Supplies."

**Find out how good a Ford C-Series tractor loader can be.**

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# OVERCOMING RESISTANCE

Low-risk, broad spectrum fungicides will lessen resistance to popular systemics.

In the late 1960s, a new generation of systemic fungicides emerged that represented a breakthrough in fungicide technology.

Initially, some predicted that these new fungicides would replace older, preventive contact fungicides because they offered systemic action, curative ability, and lower dose rates for optimum disease control.

The high efficacy of these new agents unfortunately led to over-re-

liance, exclusive use for control of certain diseases and to resistance problems unlike any previously encountered by golf course superintendents and turf care professionals.

### Resistance problems

Resistance problems first observed with systemics demonstrated that their greatest strength—highly selective single-site action—could rapidly become a weakness in the presence of resistant fungal strains.

For this reason, fungicides with single sites of action, whether contact or systemic, have come to be known as "at-risk" fungicides. These fungicides contrast with most conventional contact fungicides that have multi-site action and, therefore, a lower risk of resistance.

Single-site fungicides are prone to resistance because they act on only one enzyme or enzyme site in a fungus. Repeated use of these chemicals exerts high selection pressure.

Single-site fungicides rapidly kill all susceptible fungi, leaving only resistant fungi that, through random mutations, rely on other enzymes to exist. Thus, it is possible for an at-risk fungicide to provide excellent disease control at first, which is then followed by catastrophic fungicide failure when resistant fungi become predominant.

### Reduce selection pressure

Recent research makes it clear that disease prevention and resistance management strategies must rely more on treatments that reduce selection pressure, through the use of low-risk, multi-site contact fungicides. At-risk agents can then be used on an as-needed basis, when their powerful effects can be maximized without undue threat of resistance.

Through the increased use of low-risk, broad-spectrum fungicides such as chlorothalonil, mancozeb, anilazine and others, the effectiveness of valuable systemic agents can be preserved against resistance problems, perhaps indefinitely.

Resistance occurs whenever genetic changes in a fungal cell allow it to survive using enzymes other than the one that is attacked by the fungicide.

Whether resistance is based on changes to a single gene (monogenic) or to several genes (polygenic), resistant fungi almost always exist naturally in a population, though in small numbers.

### Resistance strength

Monogenic resistance is usually easier for a fungus to achieve; consequently, it tends to occur more often and much more quickly. Polygenic resistance seems to occur much more slowly, making it somewhat easier to combat.

Polygenic resistance is evidenced by a gradual decline in fungicide effectiveness, rather than a sudden, disruptive loss of control. As a single-site fungicide removes susceptible individuals, the population balance shifts toward those that are resistant, because they are the only ones genetically capable of surviving.

If the same treatment is used repeatedly, the resistant individuals are likely to become predominant as competition provided by the susceptible strains is eliminated.

### Pressure behind resistance

The frequency, uniformity of placement, and timing of at-risk fungicide application are factors determining the degree of selection pressure exerted on the fungal population. Together with the mode of action of the chosen fungicide and the reproductive rate of the fungus, selection pressure determines the speed at which resistance can occur.

By reducing the selection pressure on target populations, turfgrass managers can minimize the emergence of resistant strains, prolong the use of powerful but resistance-prone at-risk fungicides, and achieve the goal of attractive, disease-free turf.

The Fungicide Resistance Action Committee (FRAC) North American Working Group suggests two general strategies for reducing selection pressure exerted by at-risk fungicides:

**1.** Alternate or mix high-risk fungicides with other fungicides not having a cross-resistance potential. This normally involves the use of a broad-spectrum, multi-site contact fungicide with little resistance risk or an at-risk fungicide from a different chemical class.

**2.** Restrict use of the high-risk

*continued on page 63*

## GUIDELINES TO PREVENT OR DELAY RESISTANCE TO TURF FUNGICIDES:

1) Minimize disease conditions
   a) good cultural practices
   b) resistant cultivars

2) Make good fungicide choices
   a) be sure of the problem
   b) decide if it warrants treatment
   c) read the label- calibrate and apply properly

3) Know the chemical
   a) is it prone to resistance problems?
   b) is it protectant or curative (systemic)?
   c) to what chemical group does it belong?
      (Avoid cross-resistance problems.)

## TURF FUNGICIDE CHEMICAL GROUPS SUBJECT TO RESISTANCE PROBLEMS

1) DICARBOXIMIDES- MODERATE RISK
examples: iprodione (Chipco 26019)
vinclozolin (Vorlan)

resistance can appear suddenly, but appears unstable

Cross-resistance within the group and also to chloroneb (Terremec SP)

2) BENZIMIDAZOLES - HIGH RISK
examples: benomyl (Tersan 1991)
thiophanate-methyl (Fungo 50, Spot Kleen)
thiophanate-ethyl (Cleary's 3336)

resistance can appear suddenly, seems to remain stable: cross-resistance within the group

3) STEROL BIOSYNTHESIS INHIBITORS (SIs) (SBIs) (DMIs) LOW RISK
examples: fenarimol (Rubigan)
triadimefon (Bayleton)
propiconizol (Banner)

resistance may appear gradually and may shift back to sensitivity with time

Cross-resistance within the group (where studied).

4) PHENYLAMIDES- HIGH RISK
example: metalaxyl (Subdue)

resistance can appear suddenly and seems to remain stable

**Source:** Gail Schumann, Assistant Professor, Dept. of Plant Pathology, University of Massachusetts.

## CHOOSING COMPANION COMPOUNDS

1) Curative use needs a curative companion product.

2) Intervals should not exceed the limits of protection given by the companion product.

3) Systemic disease requires systemic partners.

4) Rates: for alternation: use FULL rates
for mixing: it may be possible to use reduced rates but this must be tested by researchers

product to just one or two periods in a season when its utility will be greatest.

Tank mixes that incorporate multi-site contact fungicides with the at-risk fungicide minimize the chance of sudden, disruptive loss of disease control. For treatment of fungi such as pythium, alternating applications of effective fungicides with different modes of action should be used.

### Strategies by groups

Resistance has been documented in four major classes of fungicides: the dicarboximides; the benzimidazoles; the sterol demethylation inhibitors; and the phenylamides. Note that while the last three classes mentioned are systemic fungicides, the dicarboximides are contact fungicides that are resistance-prone due to their single-site action.

In the dicarboximide class, the single-site, contact fungicides iprodione and vinclozolin often provide excellent protection, but resistance to iprodione has been observed for dollar spot in Michigan and pink snow mold in Washington.

Cross-resistance to vinclozolin could also be predicted, since both iprodione and vinclozolin have the same mode of action. For season-long protection against opportunistic fungal diseases such as dollar spot, it is advisable to start in spring with a broad-spectrum contact fungicide.

Early spring outbreaks of snow mold could be combatted through the use of non-dicarboximide fungicides, which have not shown evidence of resistance, especially against *fusarium nivale* strains. In this case, a broad-spectrum contact fungicide such as chlorothalonil could be used as a preventive, with additional curative power added by a benzimidazole, such as benomyl, when needed.

*Avoid the repeated use of sterol inhibitors.*

### Powdery mildew resistance

Benzimidazoles were once market-leading products due to their excellent control of dollar spot and brown patch, until resistant strains of dollar spot developed in the late 1970s.

Resistant strains of powdery mildew and fusarium patch have also been observed with the benzimidazoles.

To extend the life of these valuable agents and keep resistant strains in line, application of a broad-spectrum contact fungicide can be recommended.

Applications of broad-spectrum contact fungicides kill resistant fungal strains and help to keep the overall balance of susceptible and resistant strains intact.

### Inhibitors are selective

Due to their selective, single-site action, sterol inhibitor fungicides, including triadimefon, propiconazol, and fenarimol, are likely to select resistant strains which will remain present in the resulting population.

Because all of these fungicides have the same mode of action, they cannot be alternated with each other or cross-resistance problems can occur.

Resistance to sterol inhibitors tends to develop more gradually, resulting in a gradual decrease in effectiveness over time. It is inferred that resistance to these agents is polygenic, requiring multiple gene changes over an extended period of time.

To keep potentially resistant strains in balance, the repeated use of sterol inhibitors should be avoided.

### Phenylamides and pythium

Effective treatment of Pythium sometimes requires the use of at-risk fungicides, despite potential resistance problems.

Resistance has been noted in phenylamide fungicides for systemic pythium control, particularly metalaxyl. Other Pythium fungicides include propamocarb hydrochloride, etridiazole, chloroneb and phosethyl aluminum.

Because each of these fungicides has a different mode of action, resistance to any one can be countered by switching to one or more of the others.

Broad-spectrum contact fungicides continue to represent the cornerstone of an effective, low-risk turf disease control program.

Intelligent use of broad-spectrum contact agents opens the door for more effective and timely use of powerful but resistance-risk fungicides, which can then be used at times when they are likely to do the most damage to the fungus.

In this way, their long-term efficacy can be preserved against the threat of resistance. **LM**

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TOWARD 2000

# WHEN 'CHEMOPHOBIA' STRIKES

Industry must continue to develop lawn and landscape programs that provide economically sound pest management for turf while satisfying public concerns.

*by R. L. Brandenburg, Ph.D., N. Carolina St. Univ.*

The past year has seen a dramatic shift in public concern over pesticides. All evidence suggests that these concerns, whether real or imaginary, will proliferate and create a greater demand for changes within the green industry.

So how is the industry to face this new challenge?

It is up to lawn and landscape professionals to help discourage this pesticide phobia. The green industry needs to develop programs that provide economically sound pest management for turf and programs to satisfy the public.

## Why the recent concern?

It appears the public has developed a recent fear toward scientific developments directed at benefitting mankind. Perhaps some of this fear is the result of the media focusing on dramatic stories that emphasize the negatives of recent advances in pesticide use. Although informing the public of potential health risks is certainly the responsibility of the news media (and many do so quite accurately), some prefer to capture the public's attention with a flare for the dramatic rather than for the facts.

The concern in the turf industry has coincided with common fears of pesticide residues in food. The focus has been that we are consuming large amounts of pesticide residues. Frank E. Young, when he was the commissioner of the U.S. Food and Drug Administration, stated, "That's a myth, and another myth is that any residue, no matter how little or how legal, is harmful."

The public is confused. Not confused over the fears, but rather confused over the emotional stories and conflicting reports on the facts.

As recently as 20 years ago, science could detect residues only in parts per million. Levels of any substance up to 999 parts per billion were undetectable and showed up as zero residue. Now some substances can be found at one part in a quadrillion (1:1,000,000,000,000,000).

These measurements simply indicate an advance in science, not a new health risk.

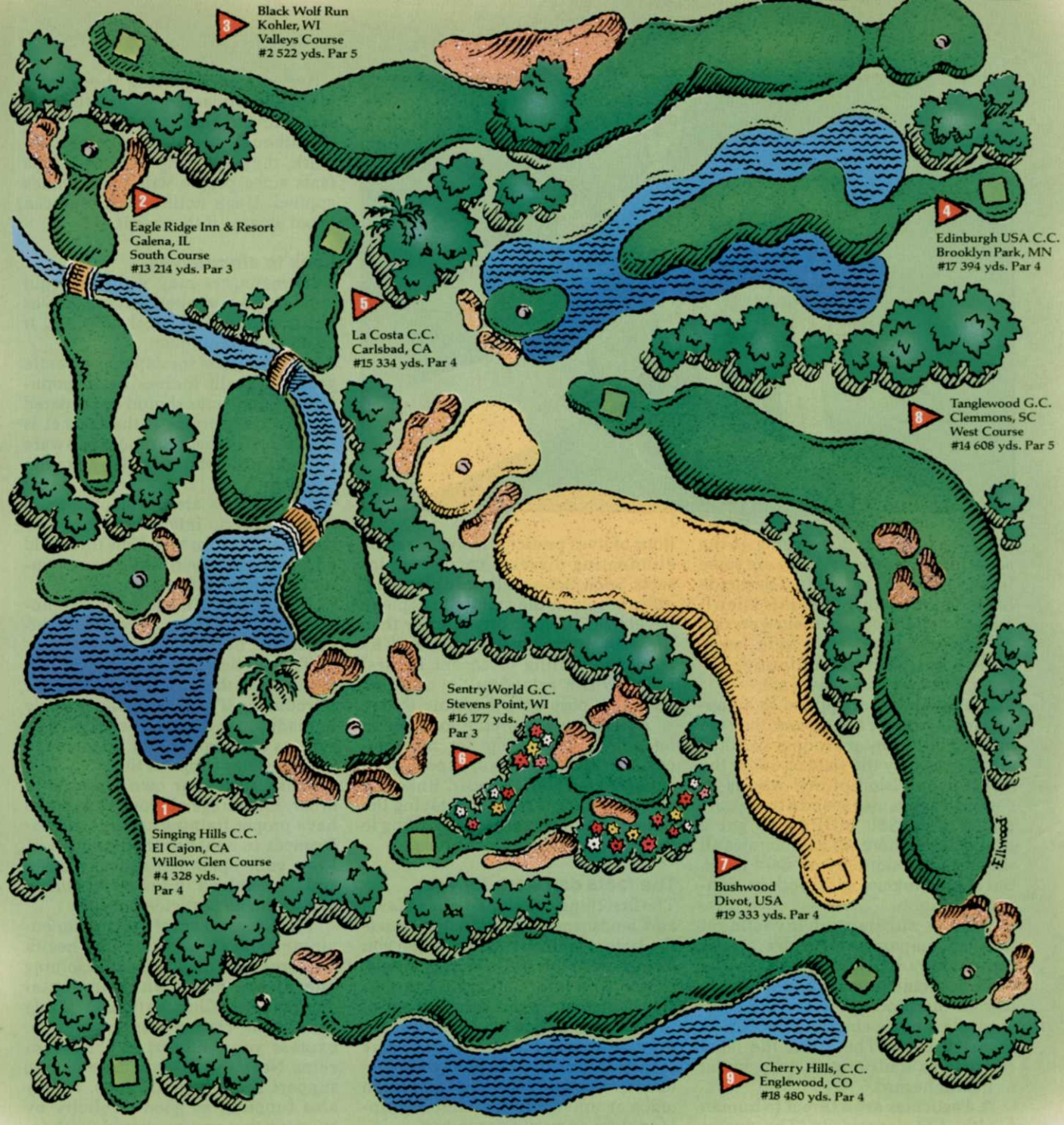
On top of all this is the fact that some consumer groups consider turf a non-essential use of pesticides. However, turf is a valuable commodity in many states that introduces billions of dollars into the economy. Turf also provides oxygen, reduces pollution, stops erosion, reduces dust and contributes many other favorable attributes to the environment and our everyday lives.

As lawn and landscape professionals, your livelihood depends on educating the public on the facts of your operations and the pesticides you use. You must also know the facts concerning pesticide risks and be prepared to discuss them in an intelligent manner. To simply disagree and fight any non-pesticide group simply creates an "us-and-them" scenario in which no one benefits. At the same time, practicing good stewardship of both the environment and of pesticide use will help ease public fears. Through a better understanding, I believe we can prevent a "snowballing" effect of the "chemophobia"-based fears we are experiencing today.

## Fact vs. fiction

One of our most difficult tasks is separating fact from fiction. This is especially difficult since we sometimes

**Public concern over the safety of pesticides should be addressed in an unemotional, professional manner. Developing their trust is an important step.**

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NORTHRUP KING

even see scientists disagreeing on the same topics. However, there are some important facts that all turf pesticide users should know. With this knowledge at hand, intelligent answers can be provided to clientele with legitimate—but perhaps, unfounded—fears. The two major fears are:

**1. Pesticides are applied in a haphazard manner.** *They are not;* they are applied either by personnel certified and licensed by the state or under the direct supervision of one who is licensed. Companies spend 8 to 10 years and $30 to $50 million to get a pesticide registered. That includes all the research, not only on field trials, but also on toxicological and environmental studies.

Such a substantial investment pushes companies to insure proper limitations are placed on the label of each pesticide. Misuse could lead to loss of the product before the company even had a chance to recoup its research costs. Therefore, the label restrictions limit any environmental or health hazard.

**2. Pesticides are a threat to human health.** *Not necessarily.* The misinformed perception of natural vs. synthetic has fueled the fire over this. People perceive "natural" foods as being healthier, yet they contain a surprising assortment of substances that consumers aren't aware exist in food.

It has been estimated that as much as 90 percent of our cancers may be related to the environment. Two articles in *Science* (April 17, 1987) present a startling presentation that the air we breathe in our home and other "natural" and daily aspects of life presents a much greater cancer risk than pesticide residues.

The public cannot forget the millions of lives pesticides have saved by eliminating diseases carried by insects. Such factors certainly play a significant role in the fact that people in developed countries live longer than those in underdeveloped ones. The public is willing to accept natural risks, while rejecting "synthetic" risks that pose only a minute threat.

Americans are living longer and healthier lives. Except for skin cancer, attributed to overexposure to sunlight, and lung cancer, linked to smoking, cancer rates are staying the same or have decreased, according to the National Cancer Institute.

## The facts can work for you

The first thing you should do as a lawn and landscape professional is to use the facts to your advantage. When you discuss pesticides with your clientele, present the information in a professional manner. Keep emotion out of the discussion. You may even want to develop a pamphlet containing some factual information to give your customers. Consult your local extension office or university for additional information on pesticides in turf.

The public has a right to know the facts. Developing a trust in you as their turf manager is a big step in the right direction. Dressing and acting in a professional manner is also critical to develop a good reputation in your clientele.

We also need to practice good stewardship of the environment and make sure we use pesticides wisely. Calibrate properly, apply as directed and don't cut corners in safety. When accidents happen, it reflects on the whole industry.

Turf professionals can't afford to fight the posting laws being passed in many states. Although this is a sensitive subject, fighting these laws gives the appearance that there is something to hide.

Although these laws require extra work, they will help diminish some fears since people will know what's applied. Upon notification, they can avoid an area if they want to.

## Look to alternatives

Turf managers may want to begin looking more at alternatives, such as cultural and biological controls, if customers want them.

Milky spore for Japanese beetle grubs is again increasing in popularity. Companies should be prepared to offer this service if the market is there. Turf managers should be aware of biological controls as they are developed.

Universities are developing more information on Integrated Pest Management (IPM) for turf. New threshold and scouting techniques are continually being refined.

The future will see a natural progression away from preventive treatments to "on demand" applications.

The public's current concerns certainly make this an excellent time for introducing IPM. The public is likely to readily pay for such services. The success of turfgrass IPM programs in several states supports this.

Make sure your own house is in order. Encourage all your workers to have proper training and attend conferences to enhance their education. Keep your operation squeaky clean and be involved in the development of reasonable pesticide policy.

Finally, as an act of concern for environmental stewardship and health concerns, you might consider joining one of the many environmental groups (Sierra Club, National Wildlife Federation, Nature Conservancy) to express your interest in their concerns. Not only will your membership support these organizations, it may also function as good publicity by showing that groups should work together for the intelligent resolution of differences in goals.

## Decisions based on fact

This article is not meant to downplay the risks involved with the use of pesticides. They must still be properly used and applied. It does, however, present a scientifically-based report on their use in home lawns.

This information should be useful in minimizing the current fear many have of the green industry. The final decision on turf management lies with the homeowner; but let the homeowner decide based on facts, not on emotion. **LM**

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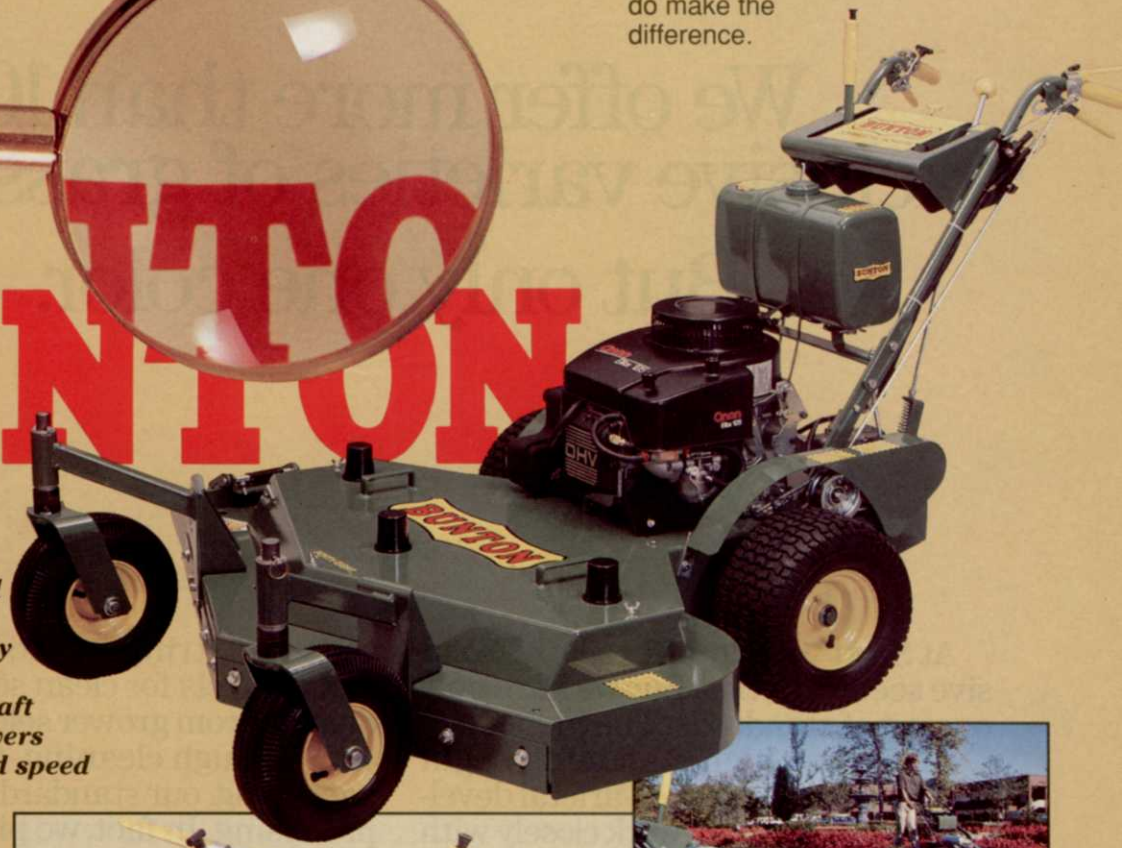


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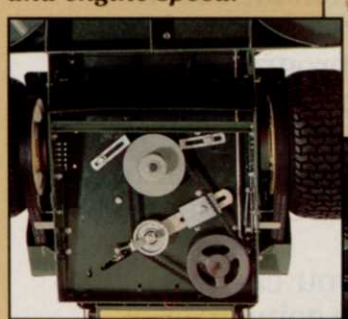

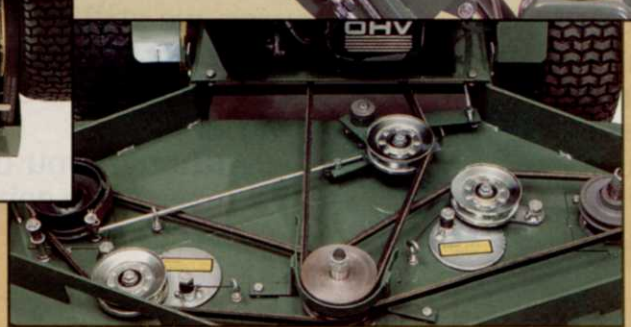


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Circle No. 165 on Reader Inquiry Card

**Daylilies show how well-placed, colorful flowers can beautify golf courses.**

# FLOWER POWER ON THE GOLF COURSE

## More golf courses are coming alive with colorful trees, shrubs, perennials and bulbs.

*by Lois Berg Stack, Ph.D., University of Maine*

A golf course is more than a broad swath of turf with plantings of trees and shrubs between fairways. More and more, today's modern golf course is being embellished with splashes of color—flowering trees and shrubs, and striking beds of flowering annuals, perennials and bulbs.

Annual flowers like geraniums and impatiens, perennials like Siberian irises and daylilies, and spring bulbs like daffodils and crocuses, have much to offer the golf course landscape.

**Some golf courses, like the Sentry Insurance course in Steven's Point, Wisc., are known for their flower plantings.**

The most obvious attribute is color. Flowers offer an endless array of shades, hues and tints from the crocuses of early spring through the chrysanthemums of late fall.

A second attribute is variety. Flowers vary tremendously in texture, color, size, shape, habit, season of flowering and foliage interest.

A third and perhaps more subtle attribute of flowers is the effect of their variety on the landscape. Flowers change dramatically from one season to the next. A landscape of trees and shrubs can be quite constant, particularly if they are evergreen. But a landscape that contains flowers changes constantly.

Each season has its own look: a touch of color brightens the spring landscape; full color develops in summer; textures emerge in autumn; and the color of flowers gives way to the architecture of trees and shrubs in winter. This change can be a great asset on a golf course, relieving the monotony of looking at the same view from one

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**Annual vinca is an ideal flower for the golf course because it produces flowers all season yet requires almost no maintenance.**

# PLAN BEFORE YOU PLANT

Hardiness is the first consideration when choosing flowers for the golf course.

This is not a factor in choosing annuals, but it is the single most important factor in selecting perennials and bulbs. Visit perennial nurseries and observe public and residential plantings to see what plants are reliably hardy in your area. Check with a landscaper, garden designer, or long-time local gardener.

Catalogs can be quite misleading, since they classify plants by generalized hardiness zones. Be aware that some "hardy" plants require mulching over the winter to survive, while others are reliably hardy with no protection at all.

Match the flowers to the environment. There is a flower for every location, from dry shade to wet sun, but there is no single flower that is adaptable to all environments.

Consider soil factors such as pH, soil temperature, nutrient levels, moisture levels and drainage; temperature factors such as frost dates, reflection of heat off buildings, and diurnal fluctuation; light factors such as intensity and duration of sunlight; wind; precipitation; and problems such as insects, weeds and diseases. Remember the old rule: choose the right plant for the location, because it's hard to change a location for a plant.

Select plants that are rated "low-maintenance." Remember that low maintenance does not mean no maintenance. Most flowers require more work than trees and shrubs. Still, with all the annuals, perennials and bulbs that are available, you can easily avoid those that require almost constant care.

Aim for full-season annuals that will provide maximum color all season, and long-lived perennials and bulbs that will perform well for many years.

Also, consider how long and at what time of year flowers are effective. Some annuals, like impatiens, flower the whole season with very little if any maintenance. Most perennials, on the other hand, flower for less than a month, but may have excellent foliage all season. Match your needs with what the plant offers.

Finally, always consider function before beauty. Remember that a golf course exists above all for the game of golf. Flowers should not interfere with the game. Flower beds and borders should be placed near the clubhouse where the public can observe their beauty, or between holes and out of play. You might want to concentrate your flowerbeds in one or two areas of the course, to maximize your crew's efficiency.

On the other hand, the course can be beautified through the judicious placement of low-maintenance bulbs and perennials among shrub and tree borders, along fences and near benches.

*—Dr. Stack*

week to the next.

### Perennials or bulbs?

Perennials need less labor, but they are generally more expensive per plant, and each perennial provides color for a limited number of weeks each season.

Flowering bulbs extend the season of color by flowering before most other plants, but they offer a limited period of effect, and many do not perform well after the first season.

The challenge facing golf course superintendents is selecting plants that give the greatest impact for the least amount of money and labor. Choose plants of good quality and plant them correctly to insure success. Design flower beds that are effective and yet do not interfere with the game. With the variety of plants available, this can be quite a challenge.

The accompanying chart of annuals, perennials and bulbs lists reliable flowers for golf courses. These plants were selected for their outstanding color for extended periods, durability throughout the season, lack of disease and insect problems, general low maintenance and availability. The suggested cultivars are not an exhaustive list, but they have proved to be successful in open landscape settings like golf courses.

### Find a reliable source

After you have selected individual flowers for golf course gardens, select a source of plants. Whenever possible, buy locally to insure that the plants will be adaptable to your general location, and visit the production site before placing an order.

Inspect the plants. They should be compact, well-branched and vigorous. The plants should also be uniform. If looking at a flat of annuals, for example, they should be of the same height, vigor, color, general size and stage of development. A flat of variable-sized plants is hard to interpret. Are some of the plants just not as vigorous as others? Or did some plants get more fertilizer than others? Whatever the reason, if the plants are not uniform in the flat, they will probably not be uniform in the landscape.

One last factor to look at is plant health. Good foliage color is a sign of a good fertilizer regime. Pale green leaves may be a sign of low nitrogen. Yellowish, weak foliage can indicate overwatering. Check the plants' roots to make sure they are vigorous and white. Look for new growth and vigor.

### Prepare to plant!

Prepare garden areas well by testing the soil and amending it as needed. If

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## Annuals, Perennials and Bulbs for the Golf Course

| Botanical name[1] | Common name | Cultivars — height, color |
|---|---|---|
| Tall annuals (over 30″ tall): | | |
| *Canna* x *generalis* | "Canna" | Many cvs — 36-48″, various colors |
| *Cleome hassleriana* | "Spider Flower" | 'Helen Campbell' — 48″, white |
| *Tagetes erecta* | "African Marigold" | 'Gold Coin' series — 36″, golds, yellows |
| Medium-height annuals (12-24″ tall): | | |
| *Achillea millefolium* | "Yarrow" | [2]Summer Pastles' — 24″, pastels |
| *Coreopsis* hybrid | "Coreopsis" | [2]Early Sunrise' — 18″, gold |
| [4]*Impatiens wallerana* | "Impatiens" | 'Super Elfin' series — 10″, various |
| [3]*Nicotiana alata* | "Flowering Tobacco" | 'Nicki' series — 24″, red, pink, white |
| *Ociumum basilicum* | "Sweet Bail" | 'Purple Ruffles' — 20″, dark purple lvs |
| *Pelargonium* x *hortorum* | "Seed Geranium" | 'Orbit' series — 18″, various<br>'Ringo' series — 18″, various |
| *Tagetes erecta* | "African Marigold" | 'Inca' series — 18″, golds, yellows |
| Low-growing annuals (under 12″ tall): | | |
| [3]*Begonia* x *semperflorens -cultorum* | "Wax Begonia" | Many cvs — 8-12″, pinks, white |
| *Catharanthus roseus* | "Annual Vinca" | 'Little' series — 10″, pinks, white |
| *Chrysanthemum* x *superbum* | "Shasta Daisy" | [2]Snow Lady' — 10″, white |
| [3]*Lobularia maritima* | "Sweet Alyssum" | 'Wonderland' series — 4″, pinks, white |
| *Sanvitalia procumbens* | "Creeping Zinnia" | 'Mandarin Orange' — 10″ orange |
| *Senecio cineraria* | "Dusty Miller" | 'Silver Lace' — 8″, lacy silver lvs |
| *Tagetes patula* | "French Marigold" | 'Boy' series — 8″, golds, yellows |
| Perennials: | | |
| [4]*Astilbe* x *arendsii* | "Astilbe" | 'Deutschland' — 24″, white (July)<br>'Red Sentinel' — 24″, red (July) |
| *Baptisia australis* | "Blue False Indigo" | none — 48″, blue flowers (May-June) |
| [4]*Dicentra eximia* | "Fringed Bleedingheart" | 'Luxuriant' — 16″, red (all summer)<br>'Zestful' — 12″, pink (all summer) |
| *Iris sibirica* | "Siberian Iris" | Many cvs — 24-48″, blues, violets, white (June) |
| *Helenium autumnale* | "Helen's-flower" | 'Butterpat' — 36″, yellow (Sept.-frost.) |
| [3]*Hemerocallis* hybrids | "Daylily" | Many cvs — 12-48″, white, blue (June-Sept.) |
| [4]*Hosta* hybrids | "Daylily" | Many cvs — 12-48″, yellows, oranges (June-Aug.) |
| *Rudbeckia* hybrid | "Coneflower" | 'Goldsturm' — 24-30″, gold (July-frost) |
| *Sedum* hybrid | "Showy Stonecrop" | 'Autumn Joy' — 24″, pink (Sept.-frost) |
| Bulbs | | |
| *Crocus* hybrids | "Crocus" | Many cvs — 6″, blue, white, yellow (Mar.-Apr.) |
| [3]*Narcissus* hybrid | "Daffodil" | 'King Alfred' — 18″, yellow (Apr.-May) |
| *Scilla sibirica* | "Siberian Squill" | Few cvs — 8″, good blue (Apr.) |
| *Tulipa* hybrids | "Tulip" | Many cvs — 6-24″, many colors (Apr.-May) |
| *Lycoris squamigera* | "Suprise Lily" | No cvs — 30″, pinkish lavender (Aug.) |

1 All plants listed perform best in full sun unless otherwise noted.
2 These specific cultivars of these perennials flower well their first season, and are excellent when treated as annuals. They may overwinter, depending on location. Most other cultivars of these are perennials, and do not flower well their first season in the garden.
3 These plants do well in full sun or partial shade.
4 These plants perform best in partial shade.

you are using a pre-emergence herbicide, rototill and rake out the bed, then apply the herbicide and rake it in lightly. Plant through the layer of soil containing herbicide granules, making sure the root balls penetrate at least slightly below the herbicide layer.

Many transplants suffer root damage when new roots grow into the soil layer containing herbicide granules. It is important that plants get off to a good start if they are to perform to their potential. Keep plants well-watered until planting time. Try to plant in the morning or late afternoon, to avoid the stress of midday sun.

Remove the plants from their containers, even if the containers are made of peat or papier-mache. These materials restrict root systems severely and can prevent them from developing properly.

Do not crowd plants. Put the entire root balls into the ground, and water immediately with a gentle soaking irrigation. Watch the plants for several days, watering as needed. Allow young plants to become established for a few weeks before mulching. This practice promotes better root system development.

The easiest style of flower bed, and one which lends great impact to the landscape, is a free-standing garden of one annual, such as geraniums or cannas, surrounded by a lower-growing annual such as sweet alyssium or dusty miller. The design might be round, oval, star-shaped or free-form. The plant material list is almost endless.

A second style of annual flower garden is just as simple, but perhaps more elegant. Use annuals to accentuate a line in the landscape. For example, plant ribbons of annuals along golf cart paths. Or plant a broad bed of annuals in front of a shrub border.

Remember to keep the design simple. Use only a few species of annuals. If you make the garden too complicated, it will be harder to plant and maintain, and people will have to study it to appreciate it (it's not always appropriate to have people stopping along the paths on a golf course).

A more sophisticated style of garden uses both annuals and perennials. The annuals in such a garden insure good color all season, while the use of perennials reduces the planting labor each year. Also, the use of a perennial that flowers either early or late in the season increases the length of time the garden produces color.

*Whenever possible, buy locally to insure that the plants will be adaptable to your general location.*

One effective combination is a garden with Siberian iris in the background, daffodils planted in front of the iris and annuals planted in the front. Another combination, to be planted at the edge of a wooded area, is shade-tolerant daffodils, with hostas behind them and impatiens in front.

Remember that there are no limits, except for your imagination. Visit public gardens and read gardening and landscape books for inspiration. Develop a list of reliable plants, and add a few "experimental" items each year. **LM**

Dr. Stack is an extension specialist in ornamental horticulture and associate professor of landscape horticulture at the University of Maine.

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# Weed Control in the Environmental Age:

**As turf management has become more sophisticated and environmentally significant, it has become absolutely essential for turf professionals to select a post-emergent herbicide that: • Has a broad enough spectrum to control virtually *all* problem weeds • Releases a minimum of active ingredients into the environment • Provides maximum safety to turf and adjacent trees and ornamentals • Reduces overall expenses (chemical *and* labor) to an absolute minimum. Read why only Trimec® Turf Herbicides can help you solve all of these problems.**

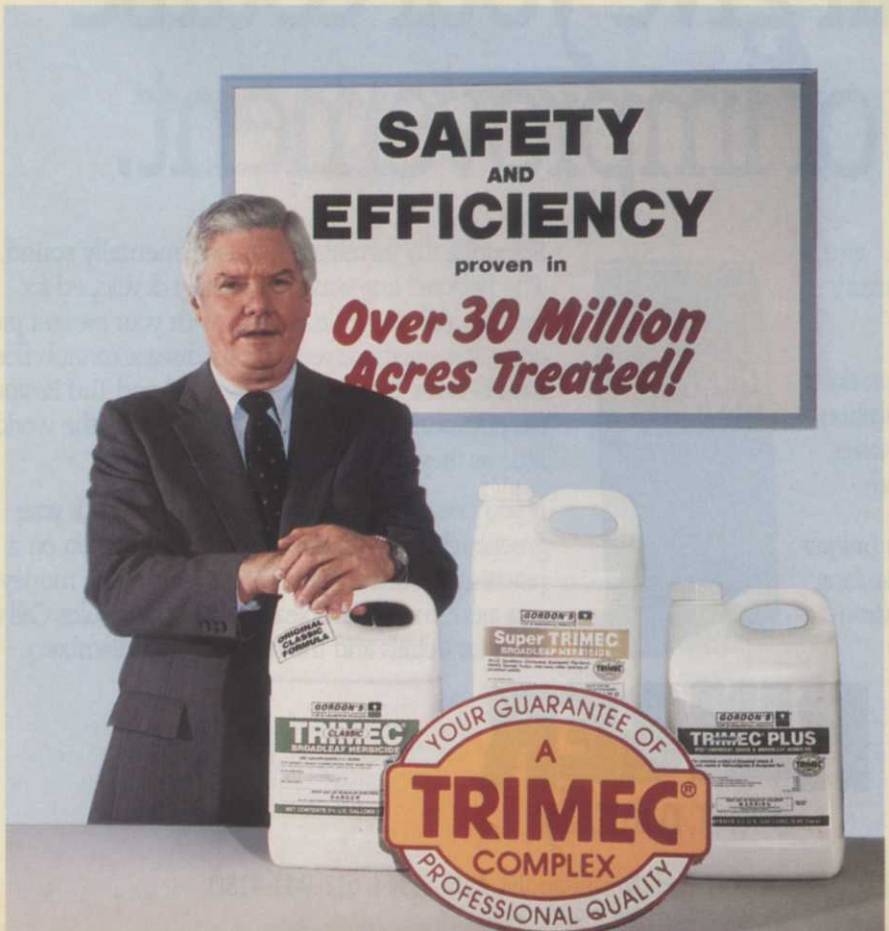
Of course you know that herbicidal activity is influenced by temperature, weed species, state of growth, and type of turfgrass. So a herbicide that would be effective in taking hardened-off spurge out of bluegrass would be totally out of place for treating dollarweed in bermudagrass.

Indeed, in light of today's complex weed control problems, the one-size-fits-all approach to herbicide selection has become totally obsolete.

As a matter of fact, in order to maximize the efficiency of weed control throughout the U.S.A., we have developed seven different Trimec Turf Herbicide formulations.

But even more important, we have developed a unique manufacturing process for each of these seven formulations so that the acid components are reacted together to form a *Complex* of unified salt, thus assuring you that every Trimec Complex will always be dependable, time after time.

For a comprehensive explanation of how a Complex differs from a formulator tank mix — and why this difference is vital to you in coping with weed control problems today — we invite you to take a close look at the schematic diagrams on the opposite page, which were drawn up for us by one of the most prestigious university professors ever involved in ornamental turf.




## Start 1990 right and early — with Trimec

Start early in the season with a broadcast treatment of Super Trimec any time when the temperature is above 40 degrees . . . even in weather with intermittent rain or snow.

This not only enables you to get those over-wintering annuals at a time when you might otherwise have a void in your work schedule, but it also enables you to get them before their roots have a chance to compete with the turfgrass you are trying to thicken up . . . and you get *all* the broadleaves because Super Trimec has the broadest spectrum of any post-emergent broadleaf herbicide.

**Everett Mealman, President of PBI/Gordon, asks: "Can any other herbicide manufacturer point to such a record of safety and efficiency?"**

☐ **Super Trimec:** Unparalleled broadleaf control for cool-weather broadcasting and spot treatment of hardened-off summer annuals such as spurge, oxalis and ground ivy. One gallon covers 4 acres.

☐ **Trimec Classic:** Unmatched efficiency for controlling broadleaves when they are actively growing. One gallon covers 2½ acres.

☐ **Trimec Plus:** The ultimate post-emergent herbicide. Outstanding control of crabgrass and nutsedge, plus all the broadleaves controlled by Classic Trimec.

☐ **Trimec Southern:** Especially designed to control broadleaves in 2,4-D-sensitive southern grasses.

☐ **Trimec 992:** The applicator's formula. Especially designed for tank mixing with liquid fertilizer and other multiple tank-mix combinations.

☐ **Trimec Encore:** A Trimec Complex that contains no 2,4-D.

☐ **Trimec Bentgrass Formula:** Especially designed for use on bentgrass.

**No matter how tough your weed problems, you can depend on a Trimec Complex for a specific solution.**

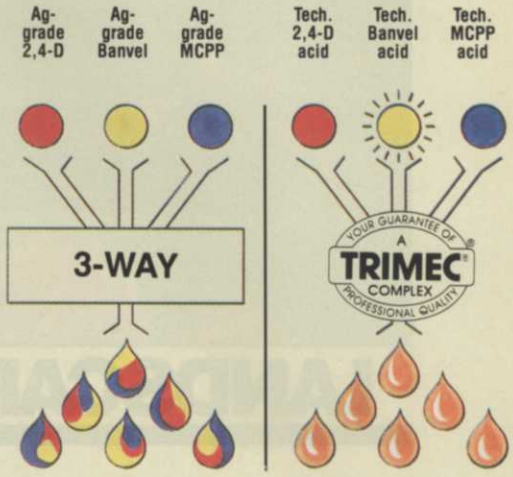
Furthermore, Super Trimec is not only extremely economical in terms of cost per acre, but it is also very friendly to the environment in that one gallon covers four acres.

If, however, you are unable to apply your first broadcast until later in the season — when the temperature is up around 75° and the weeds are actively growing — don't fret about the lost time. Simply apply the one-and-only original Classic Trimec. You'll get the same excellent weed control, and your cost per acre will be slightly less (which will help you justify not getting out earlier with Super Trimec).

Depending on the season and the condition of your turf, you may or may not need another application of Classic to treat summer annuals.

If crabgrass, goosegrass or dallisgrass become a problem, even in spite of your pre-emerge precaution, don't worry. Trimec Plus will take them out — usually with one application — without discoloring your Kentucky bluegrass or bermuda grass. And, of course, Trimec Plus will also control any broadleaves that are present.

Certainly Trimec Plus is the ultimate post-emergent herbicide . . . we have never introduced a new product that has met with such universal approval.




**Color code: Red, 2,4-D; Yellow, Banvel; Blue, MCPP; Amber, Complex acid. Note: Colors are for code only and do not in any way indicate the color of the product they are intended to identify.**

## Why only a Complex is right for weed control in ornamental turf:

Historically, the chemicals used to control weeds in ornamental turf were developed for use in agriculture, where 80% weed control is considered acceptable.

And while Trimec was specifically developed for ornamental turf, it was originally formulated by tank-mixing ag-grade 2,4-D; ag-grade MCPP; and ag-grade Banvel® (dicamba).

Although the original Trimec immediately and dramatically improved weed control over that of any other herbicide, the tank-mixing procedure of ag-grade chemicals resulted in minute inconsistencies in the chemical composition of individual droplets, with consequent inconsistencies in weed control.

To eliminate these inconsistencies, we developed a technique of reacting the acid components of Trimec together to form a unified salt Complex in which every droplet of every production run would always be an exact mirror image of the total.

The manufacturing process involved in making a Trimec Complex is a trade secret, but the basic building block is known to all chemists. It is technical dicamba (the active ingredient of Banvel) that triggers the synergistic activity and makes it chemically possible to react the acids into a Complex.

Of course, it is this same Banvel synergism that enables Trimec Complexes to be so effective with such a small amount of active ingredients . . . which in turn contributes to Trimec's unparalleled safety record, as demonstrated by the fact that more than 30 million acres of turfgrass have been treated with Trimec, and there has never been an instance in which damage to trees and ornamentals was proven to be the result of root absorption traced to Trimec when applied according to label directions.

Technical Banvel acid is the key! And since PBI/Gordon has the exclusive turf use of technical Banvel acid in North America, only PBI/Gordon can make Trimec.

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### Schematic drawings show the differences between a tank-mix and a Complex

These drawings indicate that, in a formulator's tank-mix (left), the molecules of 2,4-D, MCPP, and dicamba do not combine to form a new molecule. Accordingly, each droplet will contain its own unique amount of one or more of the ag chemicals, and control may vary from droplet to droplet.

In a Complex (right), the three acids are reacted together to form a salt Complex. When this is formulated with the other important ingredients, wetting agents, dispersants and sequestrants, as well as with continuous analytical monitoring that includes the use of a high-pressure liquid chromatograph, the unique product that is Trimec becomes a reality. Every droplet is an exact mirror image of the total, and thus precisely optimizes the intended synergistic activity.

The differences between a tank-mix and a Complex become major when the goal is cosmetic excellence.

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LANDSCAPE Guide MANAGEMENT

# CHOOSING AN IRRIGATION SYSTEM

A quality irrigation system requires a lot of work, even before the first piece of pipe is ever buried.

*by Scott D. Knowles, Wolf Creek Company*

Having an irrigation system designed and installed can be a rewarding experience. But you must focus on needed criteria like site surveys, water source determination, applied design principals and formulas, selection of qualified consultants and contractors and service.

An irrigation system is a mechanical system that efficiently takes water from one place and delivers it to the rootzone of plant material in another place, at the right time and in the right amount. This simple objective can often become a disaster, if the criteria set forth are not followed.

**This article is divided into 16 different considerations for designing an irrigation system. Here they are, for easy reference:**

1. Initial factors
2. Soil type
3. Analyzing water
4. Water sources
5. Pump system
6. System prelims
7. Water amount
8. Coverage patterns
9. Money considerations
10. Zoning
11. Valves
12. Pipe materials
13. 'Accessorizing'
14. Final design
15. Specifications
16. The contractor

## 1. Initial factors

Logically, the first step is to create a design. Whether the turf manager, irrigation consultant or contractor is going to do the design work, all system designs should follow several steps.

Before any actual design work can begin, the designer must fully understand where the system is to be installed and what it is expected to do. This is the purpose of the site review.

Many factors must be considered, but the first step is to create a scaled drawing of the area that accurately depicts the shape, size and location of all structures and planting areas.

Notes about elevation changes and wind direction will prove very helpful if either is present in an appreciable amount. Also, investigate utility rights-of-way and other areas that may preclude the installation of irrigation equipment.

## 2. Soil type

Soil type considerations must be made. Though not crucial for some systems, ignoring soil variations may be deadly on others.

Consider that a large system, such as a golf course, may encompass several soil types—each with its own rate of absorption and water retention ability. To apply water equally to each area would cause over-watering in some areas and under-watering in others. The result would be unhealthy turfgrass from too much or too little water, wasted money in water and power costs, and even ero-

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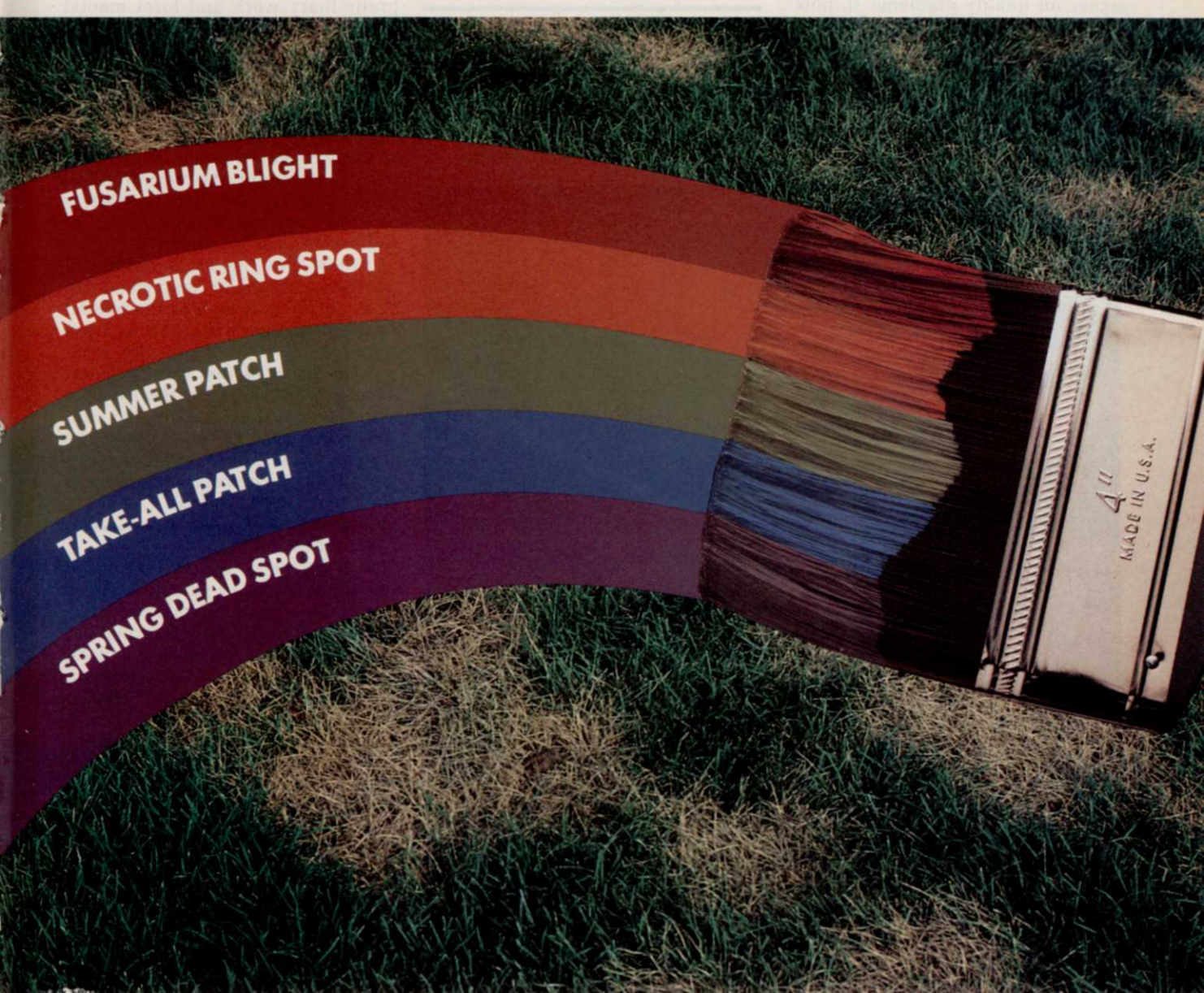
# Only Rubigan® spans the patch disease spectrum.



sion from run-off.

An irrigation system needs a sufficient quality and quantity of water. Lakes, rivers, wells and municipal water systems all may be used, if satisfactory and cost effective. It is advisable to have local experts make recommendations and provide data for both quality and quantity.

### 3. Analyzing water

Each source has individual concerns the designer must consider. Water should be analyzed for pollutants and organic matter that may harm the turf or cause problems with equipment.

Lakes tend to collect chemicals from turf via run-off and agricultural lands. Rivers and wells may have industrial or sewage contaminants; city water may contain harmful chemicals. Algae, marine plants and silt may clog pumps, valves and sprinklers, or sand may cause premature wear throughout the system.

Many solutions exist for the designer for quality problems. If, however, the quantity is insufficient, other measures must be taken.

### 4. Water sources

It is not uncommon to have a combination of water sources, at least as a recharge supply for the main source. For example, a large turf system may use one or more ponds as the water supply but uses wells, rivers or city water to re-charge the ponds when the natural supply is weak.

The re-charge system can normally operate within a 24-hour window, while the irrigation system has a shorter watering time frame, such as 10 hours for many situations.

As the water supply becomes more complicated, it increases the cost to purchase and operate the system. The designer must derive the proper equipment balance for performance, efficiency, reliability and cost effectiveness.

Other information to gather regarding the water source includes static water pressure, pipe size, and type of connection for city water. Can a deduct meter be installed? Where would a pump station be installed? Is there electrical power close by sufficient to power a booster pump, including three-phase?

### 5. Pump system

Additionally, local backflow preventer codes must be determined and implemented into the design. In some areas, backflow protection is also required for wells.

Unless an abundant supply of water, at the required pressures, can be obtained from a municipal water supply, the irrigation system will probably need a pump, or series of pumps, to supply water at the pressure and quantity required.

Whether as a pressure booster or as the supply pump, this phase of design should be left to an experienced pump station designer.

For many large turf systems the pump station may be 15 to 50 percent of the total system cost. Be sure to consider quality, performance, and service from the vendor.

While on site, many designers find it beneficial to mentally conceive the system as it would be installed. Installation problems can be foreseen and the design adjusted accordingly, instead of allowing the installer or owner to discover a problem during installation.

### 6. System prelims

The designer can double-check his preliminary work and form mental images of the area, which are helpful while working at the drawing table.

After creating the scaled drawing and reviewing the site, the designer can now make some preliminary decisions about the system, such as type of sprinklers, controllers, etc. Now is the time to consider the variations of plant materials and soil profiles in order to make the proper selection of equipment to be recomended.

At this time the brand and model numbers of the major components can be established as well as the overall concept concerning the system layout.

Also, some of the system operational guidelines can be established to help size the water supply and supporting equipment. For example, the designer should now know the soil conditions, the percolation rates, and the acreage to be covered.

### 7. Water amount

The designer now determines the amount of water to be applied on a weekly basis and the available watering window. With this information, the initial water requirements and the times of operation can be determined. From this, the designer will size the pumps, pipe, valves and sprinklers.

Armed with this data the designer can start the actual system layout, usually beginning with the sprinkler head placement. The most important criteria when laying out sprinklers is to insure an even amount of precipitation throughout the system's area of coverage. Normally this means the throw radius of one sprinkler reaching the next sprinkler, or "head-to-

**Though today's irrigation equipment is engineered for quality and performance, proper application of the technology is crucial for a good installation.**

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head" coverage.

Since the actual amount of water applied decreases toward the outer ranges of the sprinkler's throw radius, head-to-head coverage allows a more even application rate, or coefficient of uniformity (CEU), which means all areas receive about the same amount of precipitation.

## 8. Coverage patterns

There are two common sprinkler layout patterns, square and triangular spacing. Most systems include a combination due to the odd shapes of the irrigated areas.

Triangular spacing offers uniform coverage with fewer sprinklers. Instead of "head-to-head" coverage, or 50 percent diameter spacing (which is normally used in square spacing), triangular spacing allows 55 to 60 percent of diameter of throw spacing, therefore accomplishing the desired precipitation rate with fewer sprinklers.

Always remember, the wind factor can adjust these formulas up or down. Trying to save money by using the fewest heads should be discouraged, so always make sure the designer stays within the manufacturer's performance specifications.

## 9. Money considerations

A poorly designed or installed sprinkler system is extremely difficult and costly to renovate. Do not allow price to overshadow quality. If funds are not available to install a quality system, consider installing it in phases instead of skimping on the materials.

Once the sprinklers are laid out according to the design criteria and manufacturer's specifications, the next step is to divide each area into "zones" or groupings of sprinklers. This is necessary because enough water to run all the sprinklers at the same time is not normally available. Also, sprinklers with different precipitation rates can cause unequal amounts of water to be applied in an area, if operated on the same zone.

## 10. Zoning

Separating into zones also allows greater control over each area, which will be important because of differing soil types, exposure and plant water requirements.

Some sprinkler manufacturers provide "matched precipitation rate" (MPR) nozzles for their sprinklers. This allows the designer to put part circle heads on the same zone with full circle heads and still maintain an even precipitation rate throughout the area of coverage.

Each zone is controlled by a remote automatic control valve turned on by the controller. In the case of larger heads, such as those used on a golf course or large turf project, each head may have a valve built into it's casing, which means every head is, in effect, a separate zone.

## 11. Valves

Control valves, all of which are hydraulic, are normally operated by electrical solenoids, or a pressurized hydraulic valve block and tubing.

Both the electrical and hydraulic control systems have merits which should be explored. The number of heads on each zone would be determined by the amount of water needed by each head compared to the amount of water available from the water source. If a sprinkler needs 10 gallons per minute (gpm) to operate properly, then a 70-gpm water supply would allow seven sprinklers to run at the same time.

After all the sprinklers are located and zoned, the designer can now design the piping system. Since the volume of water to each zone is established, the size of the pipe and valves supplying each zone can be determined according to the flow and velocity characteristics of the pipe used. Pressure loss charts provide an easy way to size pipe and stay within acceptable velocity ranges.

## 12. Pipe materials

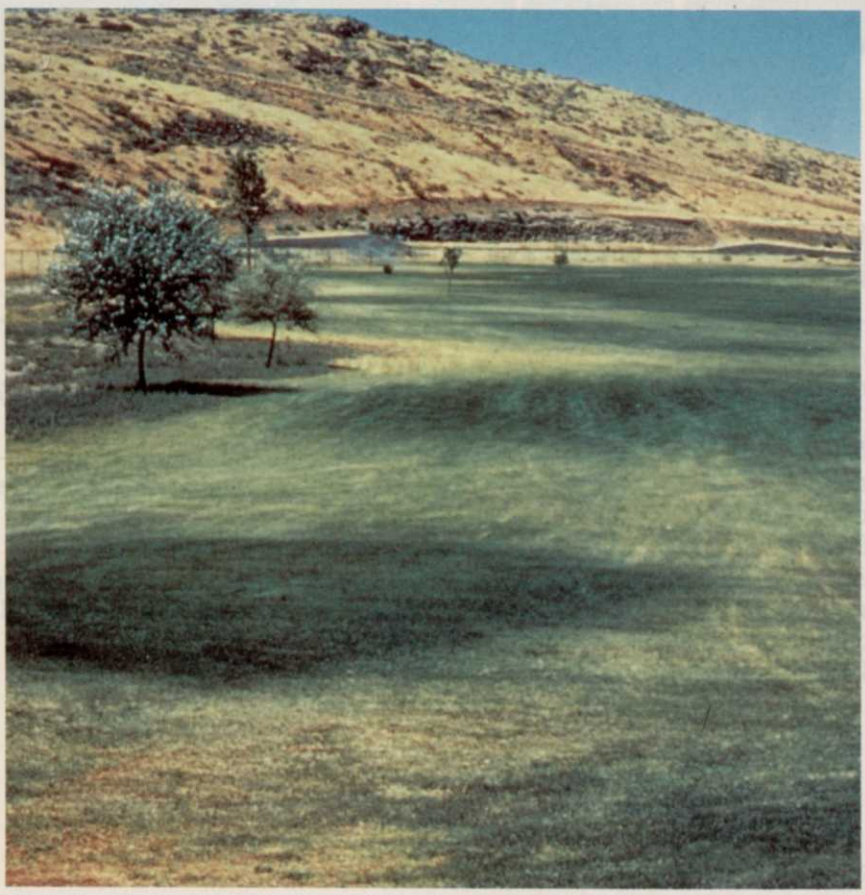
Pipe materials vary according to the requirements of the system, but most systems are now installed with polyvinyl chloride (PVC) pipe. An experienced irrigation designer will make recommendations concerning the pressure ratings and strength of the pipe. These should be followed explicitly.

Allowing lower-rated or undersized pipe to be installed will cause costly problems and may cripple the entire system. The pipe design should try to minimize the amount of trenching and pipe installation to help control the system's cost.

Certain methods for using smaller pipe sizes, such as designing in "looping," can reduce friction loss and the system cost, but the designer should never undersize pipe. If anything, use larger pipe sizes, especially if the system may be expanded in the future, or if friction losses are bordering on the unacceptable.

## 13. 'Accessorizing'

At this point, the ancillary items are designated, such as wiring and wire



**The effects of a poorly-designed irrigation system include over-watering, pest and disease problems.**

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sizes, valve boxes and controller accessories. The type of controller and controller location should also be decided.

Today's controllers range from the older style mechanical clocks to the newer computer-based systems.

Mechanical clocks are reliable and tend to be easier to learn how to operate, but lack the impressive array of functions provided by the computerized systems. Water management is now a reality with the computer-based controllers. Weather stations supply up-to-the-minute information about the field environmental conditions, which then alter the watering schedules to provide just the right amount of water when it is needed.

Another impressive feature is the ability to operate remote controllers via the telephone lines or radio communications, all from a central location. An irrigation computer can:

- control fountains and lighting systems;
- allow, because of "flow management," pump stations to run at their peak efficiency; and
- most importantly, water and power are saved, so the life of system components is extended.

After double-checking the hydraulic calculations, the plan is nearly completed.

## 14. Final design

To finish the design, a final copy is created with detail for each component of the system. Assumptions and bits of information that would be helpful to an installer should be included in the notes. The legend should include a complete list of material symbol designations. Even the hydraulic calculations can be part of the finished package.

Most designers will have completed an irrigation schedule by this time. It helps to have this prepared prior to installation as a double check of the design, and to aid in making changes in the field during installation.

Once the design is complete, the designer should develop a set of specifications for the installation of the system. This is crucial if the system is to be released for bids.

## 15. Specifications

Specifications assist in establishing a level of quality and expectations for bidders. Substandard contractors will be obvious since they will fail to meet the requirements of the specifications. Subjects to consider including in the specifications are who is to locate all underground utilities; who arranges for permits and inspections; and who installs backflow preventers.

Include statements binding the contractor to install according to local building codes and the equipment manufacturer's recommendations. Outline in detail how components are to be installed and the procedure for starting up the system. Cover payment terms, retainers, and clean-up expectations.

Establish how the contractor is to store materials and equipment and any other special working conditions. But, most of all, be specific about what needs to be done. Don't force the contractor to make assumptions.

## 16. The contractor

Several sources are available for assistance and to obtain sample specifications, including manufacturers, distributors, trade associations and some attorneys.

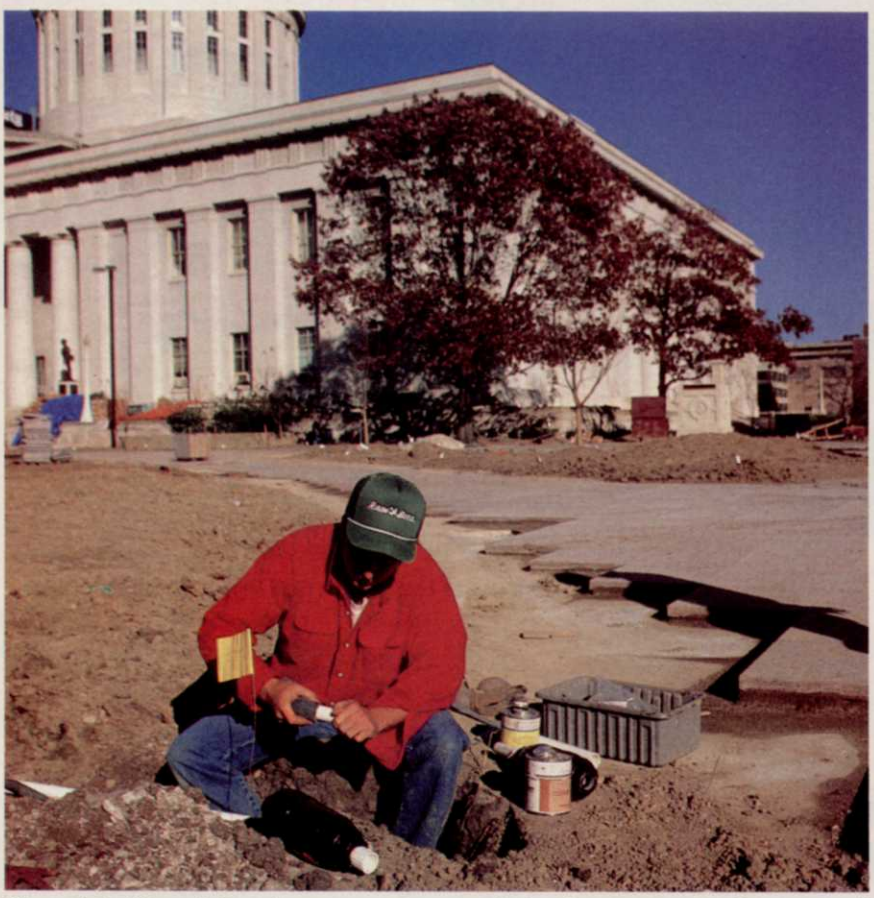
When a contractor is to be chosen to install the system, it pays to give careful attention to the selection process. Most contractors are honest, competent installers and are eager to provide the information you need for consideration. But, there are the bad apples.

A professional contractor is usually well prepared for meetings, knowledgeable about the product and the industry, and provides complete and accurate documentation. The poor contractor is usually ill-prepared, late for appointments and callbacks, offers vague answers and usually has the lowest price.

Ask for references, and really contact them. The questions asked will determine the quality of the information received, so ask specific questions about issues important to the job. Listen carefully about how problems were resolved and how well the contractor handled callbacks and service calls. Good contractors like to talk about their service because it is part of their success.

Inquire about their warranty and service procedures, especially if there is an emergency. Establish service costs up front; expect, and be willing, to pay a fair price for good service, because it is most definitely worth it.

A new irrigation system is a long term investment, offering the end user years of reliable performance, if proper care is applied to the planning phases. **LM**



**Give a lot of thought to who you want as your irrigation contractor. Request and follow up on references and ask plenty of tough questions.**

Scott Knowles is manager of turf and irrigation products for Wolf Creek Co., a Trotwood, Ohio-based distributor. He has a degree in agriculture from Ohio State University.

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J

# INSECTICIDES AND MITICIDES IN THE LANDSCAPE

When landscape plants are introduced into new environs, concerns arise over susceptibility and resistance to foreign and familiar pests.

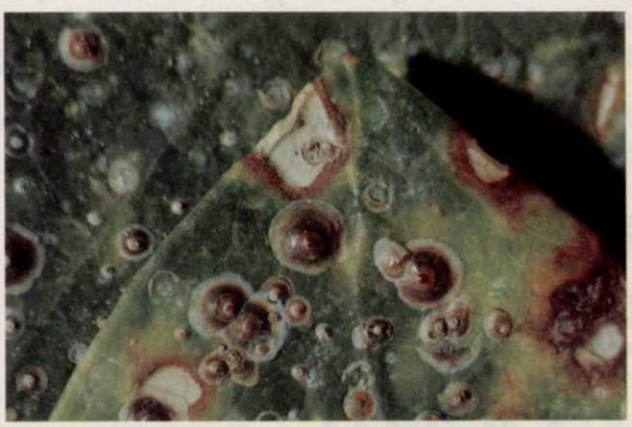
*by James R. Baker, Ph.D, and Stephen J. Toth, Jr.*

Pest management in the landscape environment is unique due to the public's contact with plants and the large number of exotic plant species and varieties.

Some of these species have little natural resistance to insects and mites. In its native land, an exotic ornamental plant may have pests that are of little consequence because of naturally occurring parasites and predators. However, if the plant is introduced into a new environment containing pests but not parasites and predators, the pests may cause considerable injury.

In addition, insecticides or miticides applied for one pest may eliminate parasites or predators of that particular pest or another pest. For example, spraying for aphids may eliminate parasites of mites and, as a result, mites may suddenly become a major problem.

**Woolly apple aphids can have a devastating effect on pyracantha.**



**Bifasciculate scale on English ivy can give a landscape manager headaches.**

## Pests go for the green

Because well-maintained landscapes are usually verdant in spite of summer droughts, many ornamental plants in the landscape are susceptible to field crop pests, such as European corn borer, corn earworm and beet armyworm. This is in addition to the pests which are usually confined to ornamental plants, such as bagworms, whiteflies (on bedding plants), Japanese weevils and many others.

The genetic resistance to pesticides by insect and mite populations has greatly aggravated problems with pest management on ornamental plants.

In cases where an insecticide or miticide fails to control a pest it once controlled, a possible solution is to switch to a chemical with a different mode of action. An insecticide or miticide in a different chemical group can have a different type of toxic effect on the pest.

## Cross-resistant pests

Pests are sometimes "cross resistant" to more than one class of chemical (for example, DDT and pyrethroids), but in most cases there is some benefit to switching to a different class of chemical when dealing with resistant pests.

Insecticides and miticides labelled for landscape use are listed according to their chemical classes in Table 1.

As a result of constant exposure to pesticides during the busy spraying season, the landscape manager has a greater risk of some deleterious effect caused by pesticides than does a homeowner who may only apply pesticides a few times a year for only a few hours at a time.

In addition to exposure during application of a pesticide, the landscape manager also encounters pesticide residues on the foliage of plants just treated or treated the week before.

The obvious ways of reducing the risks associated with pesticide use are to use less toxic pesticides and decrease the amount of exposure by using proper protective clothing or by observing optimal re-entry times after

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**TABLE 1.**

## Some insecticides and miticides labeled for use on landscape ornamentals.

**Bacterial**
- Bacillus thuringiensis (Bactospeine, Biotrol, Dipel Thuricide, Vectobac)
- Bacillus popilliae (Doom, Japademic, Milky Spore)

**Carbamates**
- Baygon
- Dycarb, Ficam, Turcam
- Lannate*
- Mesurol
- Oxamyl 10 G
- Sevin
- Vydate L*

**Chlorinated hydrocarbons**
- lindane
- Marlate
- Pentac
- Thiodan

**Pyrethroids**
- Mavrik
- Talstar
- Tempo 2

**Organophosphate**
- diazinon (D.z.n, Knox-Out)
- dimethoate (Cygon)
- Di-Syston
- Dursban
- Dylox, Proxol
- ethion
- Imidan
- Malathion (Cythion)
- Metasystox-R2
- Mocap
- Oftanol
- Orthene
- Pestroy, Sumithion
- Triumph

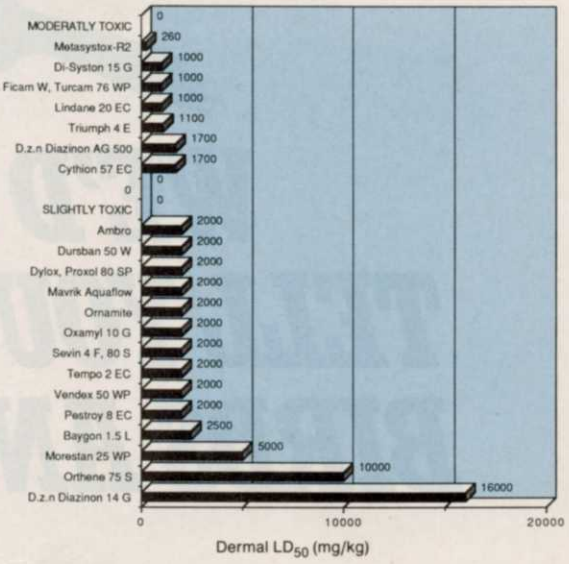
**Miscellaneous**
- Amdro
- Avid
- Insecticidal soap
- metaldehyde
- Morestan
- Ornamite
- Vendex

*Do not use on home landscapes.

**Source:** James R. Baker, Ph.D. and Stephen J. Toth, Jr.

**FIGURE 1.**

## Dermal toxicity of insecticides and miticides labeled for use on landscape ornamentals.[1]




1 Dermal toxicity is determined by the lethal dose required to kill 50 percent of the test animals ($LD_{50}$). The lower the $LD_{50}$ (i.e., the shorter the bar), the more toxic a chemical is when applied to the skin. $LD_{50}$s for Ficam W, Turcam 76 WP, Lindane 20 EC, Proxol 80 SP and Vendex 50 WP are based upon tests on rats; $LD_{50}$s for all other products are based upon tests on rabbits. Sources for the dermal $LD_{50}$ data were the companies' product material data safety sheets. In each case, the lowest $LD_{50}$ reported for the formulated products was used. Moderately toxic pesticides are those with dermal $LD_{50}$s ranging from greater than 200 mg/kg to 2,000 mg/kg. Slightly toxic pesticides are those with dermal $LD_{50}$s ranging from greater than 2,000 mg/kg to 20,000 mg/kg.

treatment.

### Factoring toxicity

When choosing a pesticide to control insects and mites in landscapes, the chemical's toxicity should be considered along with the chemical, cost, residual activity, environmental impact and effectiveness in controlling the pest.

*An insecticide or miticide in a different chemical group can have a different type of toxic effect on the pest.*

Pesticides have three major routes of entry into the body: through the mouth (oral), through the eyes or skin (dermal), or through the lungs (inhalation).

Information on the relative toxicity of a pesticide product is provided on the product's label which must contain one of the following signal words: "Danger" (highly toxic orally, dermally or by inhalation), "Warning" (moderately toxic) or "Caution" (slightly toxic).

A comparison of the dermal toxicity of insecticides and miticides commonly used in landscape management is provided in Figure 1.

Insecticidal soap and products containing the bacteria *Bacillus thuringiensis* (e.g., Bactospeine, Biotrol, Dipel, Thuricide) are not included in Figure 1 because they are generally considered to be non-toxic to humans.

### Reducing exposure

To prevent oral exposure, do not eat, drink, smoke or chew tobacco when handling or applying chemicals and wash your hands immediately after use.

Dermal exposure can be reduced by wearing adequate protective clothing and equipment during mixing and application. The product label usually contains specific protective clothing requirements. However, the minimum protective clothing that should be worn when using any insecticide or miticide are a long-sleeved shirt, long pants, and rubber or neoprene gloves.

Rubber gloves can reduce dermal exposure to pesticides by more than 95 percent. Exposure by inhalation can be prevented by wearing a respirator when applying chemicals and by avoiding treated areas immediately after an insecticide or miticide is applied unless wearing proper protective equipment. **LM**

James R. Baker (above) is professor of extension entomology at North Carolina State University. Stephen J. Toth, Jr. is an extension specialist in pesticide impact assessment at North Carolina State University.

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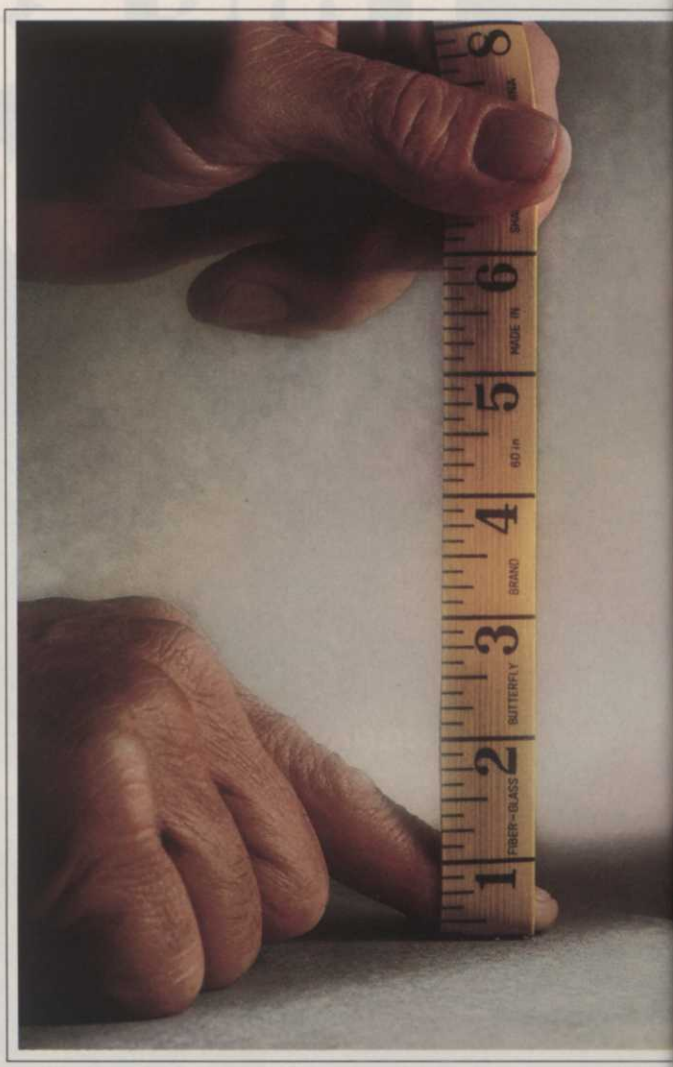
# Introducing Tempo For Home Lawns And Ornamentals.



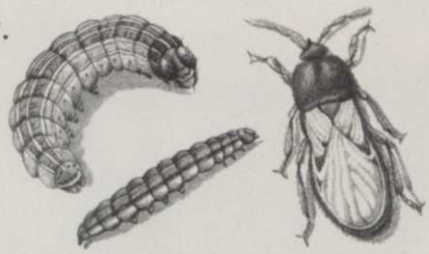
Use new TEMPO™ 2 ornamental insecticide and it will become your new standard of measure for all other insecticides. New TEMPO is the first affordable pyrethroid labeled for both ornamentals and home lawns. Better yet, it treats the same area as effectively as the leading insecticide, but with 80% less active ingredient. And that's a sizeable difference.

*Weigh the alternatives.* New TEMPO uses approximately 80% less active ingredient than the leading insecticide. Which means there's approximately 80% less chemical for you to carry around. And 80% less chemical to impact the environment.

# How To Size Up

*Measure the effectiveness.* TEMPO is a broad-spectrum, advanced-generation pyrethroid.

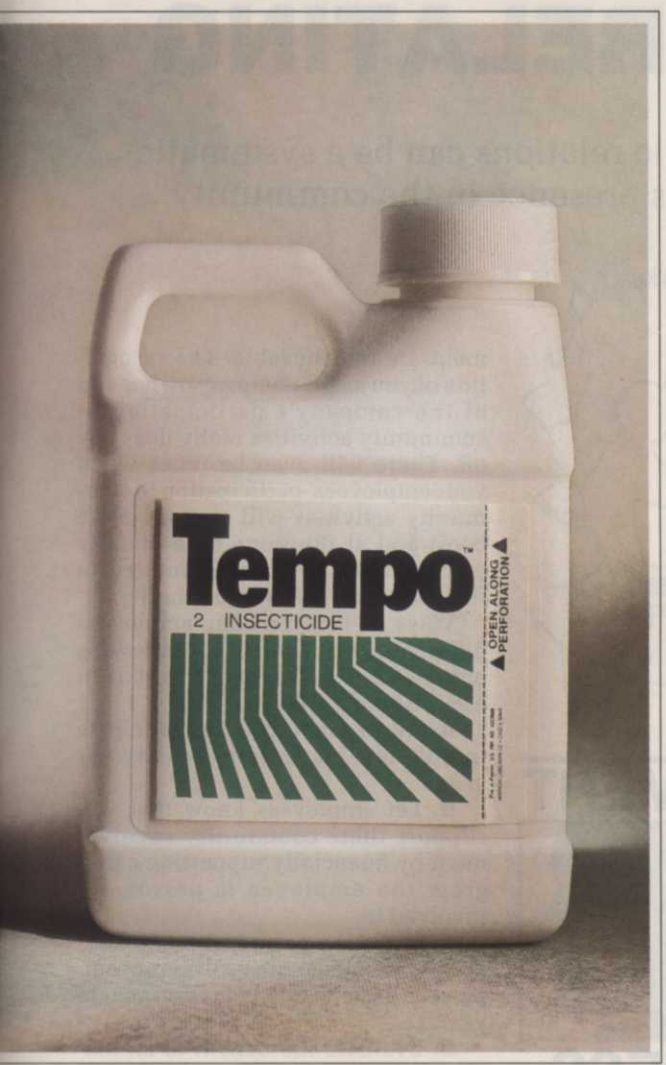
In simple terms, TEMPO effectively controls the surface-feeding insects attacking your customers' lawns. Plus, TEMPO controls the toughest ornamental pests. So using TEMPO eliminates the need to stock several different insecticides.



TEMPO effectively controls surface-feeding pests like cutworms, armyworms, chinch bugs, and sod webworms.

Here's another good reason to put TEMPO in your tank. More and more of your customers have a growing concern about Lyme disease. TEMPO effectively controls the deer tick which carries the Lyme disease virus.

*Calculate the cost.* TEMPO is the first affordable pyrethroid labeled for use on home lawns. Better yet, it's competi-




And 80% less chemical means fewer handling, mixing, and disposal hassles. In addition, TEMPO tank mixes with most fungicides and fertilizers.

*Analyze the safety.* TEMPO has a very low mammalian toxicity. So TEMPO offers maximum safety for your customers and your employees.

TEMPO is not a cholinesterase inhibitor like other insecticides. So you don't have the chore of constantly monitoring your applicators. And you don't have the applicator downtime caused by cholinesterase depression.

TEMPO reduces exposure to your customers, your employees, and the environment.

*Add it all up.* Effective broad-spectrum control on both lawns and ornamentals. Reduced handling, storing, and disposal. Reduced potential for exposure to your customers, your employees, and the environment. Plus, TEMPO has virtually no odor. And it's competitively priced.

# Your Insecticide.

tively priced with what you probably use right now. So with TEMPO, you get the latest advancements in insect control for the same price of the older insecticides.

TEMPO uses 80% less active ingredient than the leading insecticide.

*Gauge the work involved.* TEMPO uses 80% less active ingredient than the leading insecticide. So, TEMPO takes up 80% less storage space, both on and off the truck.

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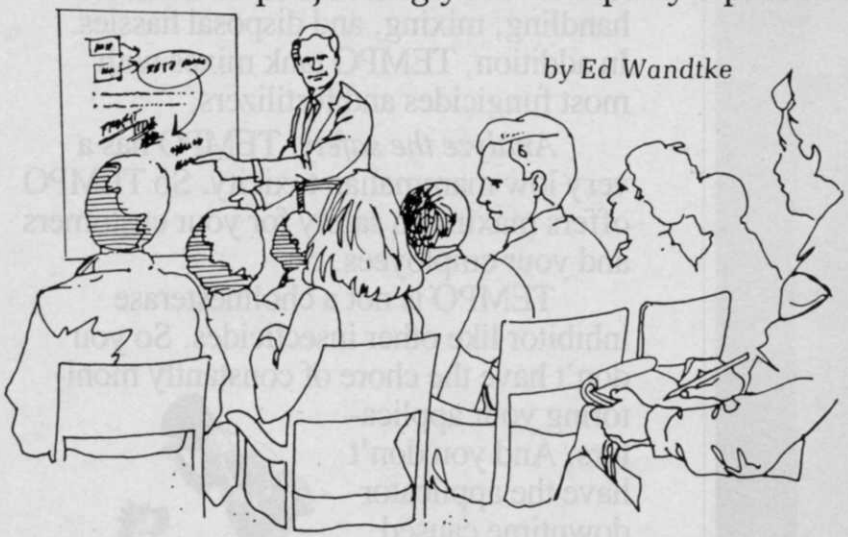
Circle No. 136 on Reader Inquiry Card

# THE ART OF RELATING

It's more than just free publicity. Public relations can be a systematic method of projecting your company's presence in the community.



by Ed Wandtke

## MANAGEMENT IN BUSINESS

Most companies in the landscape/lawn care industries secure new customers by advertising. This results in an expenditure of money to obtain customers.

But customers can be attracted through other methods. And public relations gets your message to the public in a cheaper and often more effective means than advertising.

Public relations is one of the most inexpensive ways to attract customers. The general public usually is very skeptical of advertising, but feels more comfortable and will do business with companies they hear about through public relations channels.

Public relations can benefit your company in the following ways:

**1.** Increase business through the most effective selling method of sales today: word-of-mouth or one-on-one communicating.

**2.** Create a positive image for your company.

**3.** Boost employee morale by generating goodwill that is often perceived as covering a larger geographical area than just the market area currently served.

**4.** Attract better employees—especially with current problems facing the lawn/landscape industry because of the shrinking workforce.

What, then, is the message of an effective public relations program for a company in this business?

Many owners are not aware of the fact that their company has a public image. They read in the newspapers about chemical spills, etc., and are elated that a similar problem has not occurred at their company. Yet, through an effective public relations campaign, a company's image can be improved.

A good image will attract customers. But it will *not* take the place of quality services. If the public perceives you as having a favorable image and you then provide superior quality services, it can make the difference between just being a successful company rather than a booming, growing company.

The key element in mapping an effective public relations campaign is to develop a program to take your message to the public. This can be achieved through a combination of the following methods: community involvement, public speaking, printed materials, media and the office environment.

Let's look at what can be done in each of the above areas to achieve an effective public relations program.

Networking opportunities achieved from community involvement are unbelievable. The recognition of you as the company owner and of the company's participation in community activities really does pay off. There will even be times when your employees' participation in community activities will give morale a boost and at the same time identify your company as one committed to the betterment of the community.

Ways to involve your employees differ, but you may find the following options an excellent place to start in establishing a policy:

**A.** Allow employees to participate in only one community activity per year.

**B.** Let employees know that you support their community involvement by financially supporting a program the employee is personally involved in.

**C.** Share the participation in community involvement; let different employees become involved from year to year.

**D.** Evaluate the benefit to an employee both personally and professionally from their community involvement.

**E.** If an individual has been doing community work in one organization for an extended period of time, check to see if the individual's interest and participation level are waning.

### Public speaking

Many people freeze up when they are asked to speak before an audience. To prepare to become a competent speaker, the key is to initially speak only on extremely familiar topics. Learn everything you can about your audience before you speak to them. At first, speak before audiences that you are familiar with. When preparing the speech, dedicate 15 percent to the introduction, 75 percent to the topic and 10 percent to the conclusion.

The objective in any speech is to market the company and to cover the topic competently. To affect this objective, prepare a brief introduction of yourself and the company that the moderator can easily read.

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terials to potential customers is an effective technique to secure company recognition.

The people that you target with printed materials would be:

- suppliers;
- individuals whom you know from community involvement; and
- customers and influential people in the community.

The newsletter is the key item that you should be mailing to the aforementioned list. Thus, you should develop a mailing list capability on your computer to make this system easy to execute.

### Company environment

One area that I have seen skimped on is the office. While this area does not have to be glamorous, it should be well-maintained and be a location your employees are proud to work in. Keep it painted and well-maintained in addition to introducing live plants as a method of improving appearance and projecting to any visitor a care for personnel.

Maintain an awards showcase in the reception area for show-off purposes.

Public relations is more than free publicity. It is a systematic method of projecting the company's presence in the community. Do not let it be a crisis action undertaken only when the company is having problems. Developing an effective public relations campaign takes effort, but can be systematically taken on. **LM**

Ed Wandtke is a senior consultant with All-Green Management Associates, in Columbus, Ohio. He focuses on operations and financial questions.

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Circle No. 119 on Reader Inquiry Card

# Putting yourself in the customer's place

When bidding for a job, always put yourself in the customer's shoes. And be sure you know what they *really* want before you jump to a conclusion. "Don't assume—find out."

That's the advice of consultant Eric P. McCarty, president of Management Concepts, Inc. He has worked with a number of lawn care and landscape companies.

While McCarty's tip may sound simple, many landscape professionals fail to execute that crucial part of a sales presentation.

It takes some careful inquiries to determine what the customer wants. "We call them open-ended questions," McCarty reports. One example: "What are some of the things you're thinking about?"

"They'll tell you things and then you have to pin down what's most important," McCarty says. You can do that by asking, "What do you think is most important to you?"

Then it can be narrowed down by use of a closed-ended question: "Is the entry way the thing we have to concentrate on?"

"You get their needs and what their priorities are," McCarty explains. He cautions contractors against listing all that they offer—let the customer say what is wanted, and then describe what you can do to meet their needs.

McCarty uses the words "features" and "benefits" to illustrate the point. A feature might be that three inches of mulch is put on each bed. The benefit is that unsightly weeds won't compete with the colorful spring flowers and shrubs.

You could tell a customer that the lawn will be mowed or sprayed at certain times, and the customer's response may be, "So what?"

You can say to the prospect words to the effect that "you're going to see a lovely lawn with this backdrop and your neighbor's going to enjoy it, too."

Creating "word pictures" is a good way to describe benefits. An offer of mowing service can include a statement about how the customer can sit back and relax in the shade while a trained professional does all that hot work. And think of the extra leisure time you're getting.

McCarty urges contractors to use picture books when selling their services. And the pictures should include happy *people* in them. "That's what we sell in our business."

A firm that installs Jacuzzis has a picture book with several color photographs.

One picture is of a happy couple with drinks enjoying the tub.

Another shot is of a happy mother and baby in the tub.

The third photo is of a happy older man relaxing with a cigar and drink.

The photos depict how people with different needs can enjoy the facility.

When talking about the cost, refer to it as an "investment" rather than using words like "price" or "spending."

Avoid asking, "How much do you want to spend?" McCarty says a good method is to say, "We can really do these things, but it would help me to find out how much you plan to invest."

"That tells them why you are asking the question," McCarty explains.

Try not to back down too soon on price, McCarty advises. "It's been our experience that landscape sales people tend to assume that people won't spend as much as they will."

Defend your prices by noting that property improvements don't depreciate like cars and boats—and that a beautiful yard can be enjoyed every day.

Above all, try to put yourself in the customer's shoes. To illustrate the point, McCarty, 61, tells of when he sought to have a Jacuzzi whirlpool constructed in his backyard deck. He says the reaction of the salesperson seemed to imply: "You want a Jacuzzi at *your* age?"

Needless to say, that salesperson did not make the best impression. He also did not get the job.

"He jumped to a conclusion about what I wanted or didn't want," McCarty recalls.

"When you're talking to people you want to address where *they're* coming from," says McCarty. "It always has to tie in to what they perceive."

In the Jacuzzi episode, McCarty sought a place to relax after a hard day's work. The salesperson was thinking about "yuppies and swingers" enjoying the tubs and he determined that "people my age don't do that," McCarty remembers. "Don't go prejudging it," he advises.

"You're trying to tell me something about where I'm coming from—and you don't know."

—*James E. Guyette*□

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The National Arbor Day Foundation

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Circle No. 111 on Reader Inquiry Card

# Over-the-top picture-perfect weed control.

# Stopping these bugs can be a 'chinch'

They're called "surface insects," but they're much more elusive than that. They're the pests that live within the leaf and stem zone or sometimes hide out in thatch. They burrow by day and feed by night. Among the most troublesome are chinch bugs, white grubs and sod web worms.

But every problem has a solution, and Dr. Louis Vasvary of Rutgers believes the solution to this annual surface insect problem begins with inspection. "One of the major considerations to keep in mind," he begins, "is the fact that with many of our insect problems, the injury is similar. The grass could be turning brown due to an environmental condition such as drought, or it could be caused by a host of other things."

Vasvary says inspection must be thorough, and include all grass areas, not just those that are injured. Get a good cross section of what type of insects are present, identify them, and include the relative numbers involved.

In most instances where grass shows signs of stress, a decision to select the appropriate insecticide is required.

"Make sure that application takes into account the habits of the insect: where it lives, how it lives and where it feeds. That is the key to successful control of surface insects."

### Bluegrass, fescue diet

Chinch bugs feed on Kentucky bluegrass and fescues. Golf course superintendents occasionally find them in bentgrass and perennial rye.

"Chinch bug injury looks a good deal like other types of injury that will occur on grass. However, in most instances, you'll find chinch bugs in the open where it's sunny and warm. Those are the conditions they most enjoy. Cool, wet situations are not satisfactory for chinch bugs."

Chinch bugs can be difficult to see; they grow to a mere 1/5-inch as adults. "As far as development," explains Vasvary, "the cell stages look pretty much the same. The immature stages pretty much resemble the adult except the adult has full wings."

For New Jersey-based companies, Vasvary says a good portion of that states chinch bug populace are short-winged even in the adult stage. In its initial stage of growth, the bug is reddish in color, and sports a white band.

Chinch bugs will usually take up residence in more protected areas: under large clumps of grass, near sidewalk edges, under railroad ties in landscaping. During winter, they will often crawl up under aluminum siding.

### Know the life cycle

Vasvary says an important part of the chinch bug control strategy is to know its life cycle.

The overwintering stage is during March and April. Very often, these populations can be low. "If we have an open winter, a cold winter without snow, that will reduce the population. Snow cover acts as a blanket and will help maintain the population."

*In most instances, you'll find chinch bugs out in the open areas, where it's sunny and warm.*

**Much of New Jersey's adult chinch bug population sport short wings. Photo courtesy Dr. Vasvary**

The first hatching occurs in spring. This is followed by a nymphal stage, and finally, in July, the adult stage. Another set of eggs will begin to develop in late August and early September.

Vasvary says one chemical control scheme that works well was suggested by Dr. Harry Niemczyk of Ohio State. It involves applications in April, when adult populations are quite low.

"This works exceptionally well in areas that have chinch bug populations year after year," Vasvary concurs. "In areas where grass type is correct and thatch exists, there is a good amount of survival. By applying control measures in the spring during April, it further suppresses that overwintering population, to a degree that it never has a chance to build up during the rest of the year."

### Don't forget to water

Vasvary says to accompany chemical applications with enough water "If the area has not been irrigated beforehand, and the area has not received rainfall seven to 10 days before treatment," he says. "It's best to charge that area with water.

"If the thatch is practically nonexistent, a quarter-inch of water is satisfactory. If thatch is thick, a half-inch of irrigation would be better as far as control is concerned."

Water charges the thatch layer so that the insecticide has a chance to penetrate.

"So in this particular case, without rainfall and with dry thatch areas, rather than making the treatment and then watering afterwards, charge the thatch with water first, make the treatment with insecticide and water again. That has made the difference between success and failure."

### Products you can use

Vasvary says Dursban has a good track record for chinch bug control. Another is diazinon, which also works well against other surface feeders.

Tempo is a third-generation pyrethroid, which Vasvary says is somewhat expensive, but very often the pyrethroids do get a little more movement out of insects.

Mavrik is another pyrethroid. "Those who work with shade trees or woody ornamentals are familiar with Mavrik, which became available a few years back. It too, is labeled for chinch bug control," Vasvary says.

Control for second generation infestations of mid-August corresponds to the appropriate timing for control of white grubs, when they're small and close to the surface. You have an opportunity here to use a material that's labelled for chinch bugs and white grubs. Vasvary says to use the same watering technique.

Chemicals labelled for chinch bugs and white grubs include Triumph, Dicarb, Turcam and Mocap. Keep the last three for treatment in the fall or late summer, rather than use them continuously throughout the year.

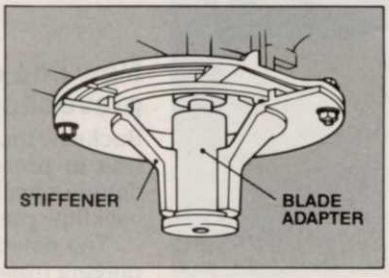
Alternating chemicals might be required from time to time due to the insects' chemical tolerance.

—*Terry McIver*□

# We stake our reputation on it.

## We're so sure our revolutionary new walk-behind 2-cycle crankshaft system will stand up to what you run into, that we're backing it with an exclusive two-year warranty.

No one else in the industry offers a two-year crankshaft warranty on small trimming mowers. Because no one else has what Jacobsen has. A revolutionary (patent applied for) crankshaft protection device incorporating an adapter and stiffener that help prevent twisting, bending or breakage. Thus, effectively extending engine and equipment life, while maximizing productive cutting time.




In fact, extensive testing showed this unique Jacobsen design to be vastly superior to anything in the market. At full throttle, a solid steel, one-inch shaft was placed in the path of the rotary blade. Competitive crankshafts bent on contact, yet the Jacobsen crankshaft survived. Not once, but again and again, without damage.

Combine the exclusive new Jacobsen crankshaft system with our durable 2-cycle engine, rugged lightweight aluminum magnesium alloy deck, heavy-duty greasable wheels, large five-quart fuel tank and shock-absorbing front bumper and you've got the most reliable commercial walk-behind available. We guarantee it.

So see your nearest Jacobsen Commercial Products dealer for more information and a free demonstration of the industry's most durable walk-behind rotary mower.

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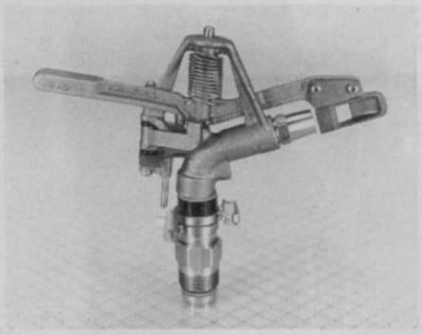
## Heavy-duty sprinkler handles abrasive water

Rain Bird says The Tough Bird heavy duty pivot sprinkler (model 85EHD-LA) was developed for use in the highly abrasive water conditions normally experienced on center pivot machines.



According to Rain Bird, the sprinkler's 17° body performs well in areas experiencing extreme winds.

The sprinkler bearing is completely protected from dirty water intrusion, resulting in extremely long bearing life in the demanding conditions of center pivot use. This is accomplished by the newly designed hooded top seal assembly, which completely encloses the upper bearing area, coupled with Rain Bird's "H" style bearing with a beefed up bearing washer stack.

Rain Bird says the locking friction collars are virtually indestructible, and have extended tabs for improved performance. The arm and upper trip are reinforced with stainless steel buttons to inhibit wear at the interface of the arm and upper trip.

The newly designed trip assembly is manufactured with heavier brass sections, and features hooded bearings to maximize reliability and to eliminate wear at the interface of the trips.

**Circle No. 191 on Reader Inquiry Card**

## New adjustable sprinkler has many applications

The I-40 ADS from Hunter Industries is an adjustable arc sprinker designed for sports fields, golf courses, cemeteries and other large turf areas.

The highly versatile sprinkler may be set at any arc between 40° and 360° with a simple adjustment that can be made when the water is on or off. For installations that require full circle coverage, the I-40 is available as model I-40-36S, a fixed 360° circle.

Both models are supplied with five interchangeable nozzles to vary the radius and discharge rate. The radius may be varied from 45 feet to 67 feet; the discharge rate may be adjusted from 7 gpm to 25.3 gpm.

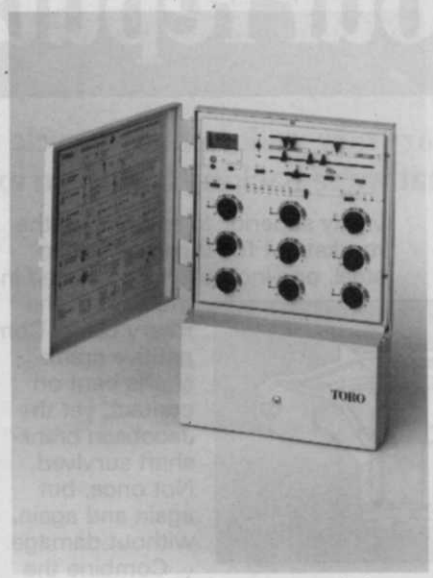
Hunter says the sprinklers include safety-cushioned rubber covers and reliable stainless steel risers. Vandal-resistant features include a 1⅝ inch exposed surface diameter and heavy-duty retraction spring.

A drain check valve with up to 15-foot change in elevation is also standard.

**Circle No. 192 on Reader Inquiry Card**

## Water efficiency goals the quest of controllers

The Vision II irrigation controllers from Toro offer dual programming in six-, nine- and 12-station models, up to 14-day scheduling and three watering start times per program. The cabinets come in plastic or metal, with a pedestal mount option available for metal cabinets.




"We're seeing increasingly frequent droughts, depletion and pollution of our groundwater resources, says Wade Terry, director of sales, marketing and service. "Water conservation today is imperative."

These state-of-the-art controllers feature an exclusive Water Conservation Control that lets the user adjust all watering run times from 25 percent to 200 percent. Dual programming makes the Vision II compatible with a variety of lawns and gardens. A Watering Delay system lets the user turn the system off temporarily for one to four days; restart is automatic.

**Circle No. 193 on Reader Inquiry Card**

## Injectable wetting agent saves water, labor

Aquatrols is introducing a new soil wetting agent formulation, AquaGro Injectable, for injecting into golf and landscape irrigation systems. Injectable is a low-viscosity formulation containing 33 percent AquaGro soil wetting agent. The new formulation can be injected into irrigation systems using any commercially available irrigation injection pump.

With AquaGro Injectable, the user can easily adjust rates and application frequency to obtain the desired level of wetting agent performance and economy.

"Golf course superintendents are telling us that injecting soil wetting agents is an ideal method of applying them to get the benefits all over the course, especially fairways," says Robert Moore, company president.

Aquatrols says the AquaGro Injectable will reduce water run-off and evaporation and enhance the performance of water soluble chemicals. AquaGro is available through more than 100 turf distributors across the country.

**Circle No. 194 on Reader Inquiry Card**

## New line of backflow prevention devices ready

Buckner, Inc. recently released a full line of pressure vacuum breakers, double check and reduced pressure backflow prevention devices.

The devices are available in sizes ranging from ½- to 2-inches, and incorporate a removable bronze seat. They are available with or without ball valves. All ball valves and test

*continued on page 104*

# CUT YOUR TURF PROBLEMS DOWN TO SIZE

## with HYDRO-POWER 180

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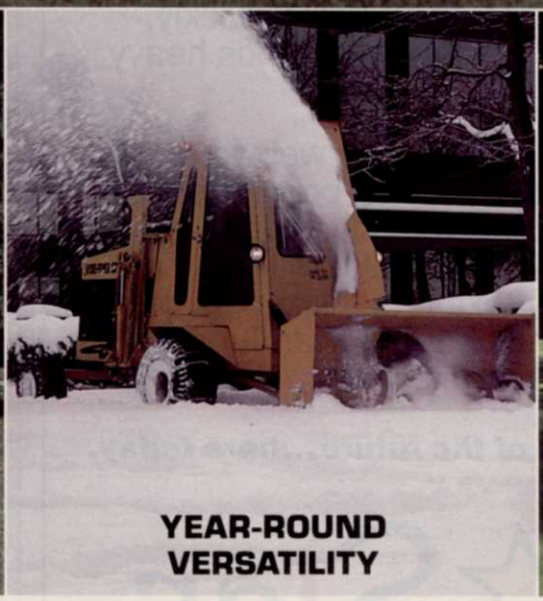

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**Your search for a high capacity mower encompassing a one man operation is now concluded. The Hydro-Power 180 with its 15 foot hydraulically driven rotary mower has a mowing capacity of up to 11 acres an hour while incorporating rear wheel steering for maximum maneuverability. Cutting units are designed for maximum floatation and may be used individually or in any combination of the three.**

**A foot pedal controlled hydrostatic transmission affords variable mowing speeds as well as transport speed to insure maximum travel time between the job sites. The Hydro-Power 180 offers year-round versatility with a 2-stage, 73'' snow blower and heated cab.**

**Manufactured by** HOWARD PRICE TURF EQUIPMENT **18155 Edison Avenue Chesterfield, Mo. 63017**

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Put your sod farm, your athletic field, your fairway, park and lawn areas ahead of the times with All★Star. Seed with confidence because this is a proven perennial ryegrass that grows in sun and shade, germinates quickly, forming an attractive turf that withstands heavy traffic.

Because All★Star resists sod webworms and other turf insects as well as brown patch, leaf spot and crown rust, you have a low maintenance turf. And where else will you find such a uniform, richly textured, thick, dark-green turf? That's why it's named All★Star! It grows well with bluegrasses and fescues.

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Circle No. 101 on Reader Inquiry Card

cocks are resilient seated.
**Circle No. 195 on Reader Inquiry Card**

## Lawn edger designed with four cycles

Homelite Division of Textron, Inc. has developed a new four-cycle lawn edger, the model E300HD. Homelite says innovative features, heavy-duty

construction and compact design make this unit the ideal edger for the commercial user.

Homelite says state-of-the-art components make the E300HD more efficient and almost maintenance free. A magnetron solid-state ignition provides reliable starts with no maintenance. A ball-bearing cutter head gives the unit long life and smooth performance. A wide front wheel provides stability and balance and makes the unit easy to maneuver in tough edging situations. The blade depth control is at the operator's fingertips for precise depth control when edging along curves. A simple lever permits four-position cutterhead adjustments for bevel cutting (either right or left angles).
**Circle No. 196 on Reader Inquiry Card**

## Large mowing unit covers lots of ground easily

The Hustler Range Wing attachment

Surflan. Roundup. Mix them together, and you've got control that knocks weeds down and keeps them down. Three times longer, in fact, than Roundup alone.

That's what landscapers all across the country are now finding. They are getting better weed control and more satisfied customers. And they're saving time and labor costs because they're applying just once.

With a Surflan/Roundup tank-mix, you get complete control of over 50 different weeds—including such tough species as crabgrass, barnyardgrass, chickweed, spurge, johnsongrass and foxtail. And Surflan won't harm your nearby landscaped areas, either. It works with little or no lateral movement.

Join the growing list of satisfied users. Add Surflan to your Roundup and stretch your weed control three times longer. See your Elanco distributor for Surflan. Or call toll-free: **1-800-352-6776.**

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Circle No. 116 on Reader Inquiry Card

from Excel Industries covers more than 12 feet of turf in one pass.

Excel says the Range Wing is the only commercial wing mower on the

market that can turn 360 degrees within its own width.

The main deck of the Range Wing mower attachment is an upfront, 72-inch dual trim deck with 9¾-inch offset trim capability on both sides. Each side wing is 48 inches wide with rear discharge and can be raised or lowered separately to easily maneuver around obstacles and through gates. Each deck floats independently up to 20° above and below the terrain, resulting in a smooth even cut that virtually eliminates scalping. Single or dual wings can be used on Hustler models 340, 400 and 440.

Hustler's efficient deck drive system allows for more power with a smaller engine, making it one of the best large acreage mowing values on the market today. All Hustler mowers feature one-hand hydraulic steering for true zero-degree radius turning and total control of forward and reverse speeds, braking and turns.

**Circle No. 197 on Reader Inquiry Card**

## Diesel-powered mower offers cruise control

Gravely's first diesel and newest, largest commercial mower is the Pro Master 30-H. It features a 30-hp Yanmar diesel, Sundstrand hydrostatic

transmission and 72-inch deck. Built for fast mowing and dependability, it turns leaving a zero-uncut-circle. The Pro Master is equipped with a direct-drive PTO.

Power steering and cruise control are standard.

**Circle No. 198 on Reader Inquiry Card**

## Five-gang mower converts to a verticutting unit

The hydraulically driven 5-gang

Verti-Reel cutting unit from Kubota is two units in one.

A quality cut blade reel mower easily converts to a verticutting unit. The cutting height can be precisely set from ⅜ to three inches. The Kubota line of Verti-Reel products provides complete mowing and cutting units designed and built for total turf management.

**Circle No. 199 on Reader Inquiry Card**

*continued on page 108*


# "WE SPRAYED 62,000 ROSES WITH WILT-PRUF AND LOST LESS THAN 50!"

*– Tony Notaro, owner, Larchwood Construction Co., Holtsville and Rochester, N.Y.*

Tony Notaro's landscaping business has grown from zero to one of the 25 largest in the nation in just 32 years.

*Tony and daughter Kathy inspect a juniper before planting.*

Notaro was landscape contractor for the Levittowns, planting 14,000 homes on Long Island, 5,000 in Delaware and Virginia and 3,000 in Florida. He most recently completed a million dollar landscape renovation of the Flushing Meadow Zoo in New York City. That landscape includes rare and exotic plants, plus wildflowers and other meadow grasses.

"We transport and plant lots of 12-to-24 inch caliper trees," Notaro said. "The nursery digs and tags the trees. Our standard procedure is to require the supplier or grower to spray the trees with Wilt-Pruf before we start to dig. We like to hold freshly dug trees in the shade for about 10 days and keep the wrapped ball wet on each tree during the entire period."

Notaro takes pride in his landscaping business. That's just one of the reasons he uses and recommends Wilt-Pruf.

Wilt-Pruf is the proven way to reduce moisture loss and drying out when plants are under stress. Order from your distributor today.

*A longtime member of the Associated Landscape Contractors of America (ALCA), Notaro encourages landscapers to join ALCA to stay up-to-date on technical knowledge and exchange information.*

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# Lawn-Plex®
# IS A GREAT "MIXER"!

## *"Tank mixer"* that is.

- **Lawn Plex®** is the FULLY CHELATED iron product you should use in your tank mix.
- It contains 8% Iron plus 8% Sulfur, and is COMPATIBLE with your *fertilizers* and *pesticides*, even in low-volume applications.
- **Lawn-Plex®** is also a TRUE BUFFER which means, it will adjust your tank mix pH for maximum pesticide performance.

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*Unequaled Micronutrient Technology*

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Circle No. 261 on Reader Inquiry Card

**PRODUCTS** *from page 106*

## New triplex mower steers easily, with 62-inch width

The Jacobsen Greens King IV comes with newly designed, easy-on/easy-off grass catchers.

Easier steering is another feature. The cutting units "float" to follow ground contours. Patented steering

action virtually eliminates marking during turns. Reels lift with a convenient foot pedal, and stay level while raising and lowering to prevent scuffing.

A 62-inch cutting width means 18 average-sized greens can be mowed in under four hours.

The Greens King IV is the only triplex available with the patented Turf Groomer greens conditioner, to make greens healthier and faster.

**Circle No. 200 on Reader Inquiry Card**

## Single-arm mower offers choice of cutting heads

The Micro-Mower Company has a new, single-arm mower for 15-30 hp compact tractors.

The mower offers a choice of cutting heads: EPA 52-inch multi-purpose rotary head and a reversible 41-inch high speed flail. A unique "hydra-hover" floating arm system allows the cutting head to "float" and follow the contour of the turf, reducing the chance of scalping.

Micro-Mower says the mowers are self-contained and attach to the three-point hitch to facilitate easy mounting. The unit reaches to the left and right side, up to 92.5 inches from the center of the tractor.

**Circle No. 201 on Reader Inquiry Card**

## Drug testing kit yields instant results

The Wells Fargo InstaScreen drug screening system gives fast, reliable and affordable tools against employee drug abuse.

Using urinalysis, the patented InstaScreen test helps you instantly confirm the presence or absence of five controlled substances: marijuana, cocaine, heroin, amphetamines or PCP.

InstaScreen is completely self-contained, allowing applicant to be screened in your own facility, eliminating chain of custody worries, refrigeration, long time delays, as well as the possibility of contamination or losing a specimen.

**Circle No. 202 on Reader Inquiry Card**

## Tree chipper features hydraulic feed system

The 19L Tree Bandit whole tree chipper from Bandit Industries, Inc. features a powerful, yet simple hydraulic feed wheel system close

coupled to the chipper disc, allowing it to reduce very limby whole trees to chips in seconds.

The unique design of the hydraulic swivel chip discharge allows the chips to be discharged in a 220° arch to either side or over the tongue. Chips can thus be blown into a chip box on the towing vehicle, making it possible to work from the roadway, blocking only one lane.

The swivel discharge is convenient for spreading chips on the site and to separate chips into piles.

The loader is located over and to the right of the infeed, providing the operator an excellent view of the infeed spout, the landing and the chip discharge.

The 19L is designed for off-road use. Large, 20-inch tires and dual axles give good ground clearance, floatation and balance.

**Circle No. 203 on Reader Inquiry Card**

*continued on page 110*

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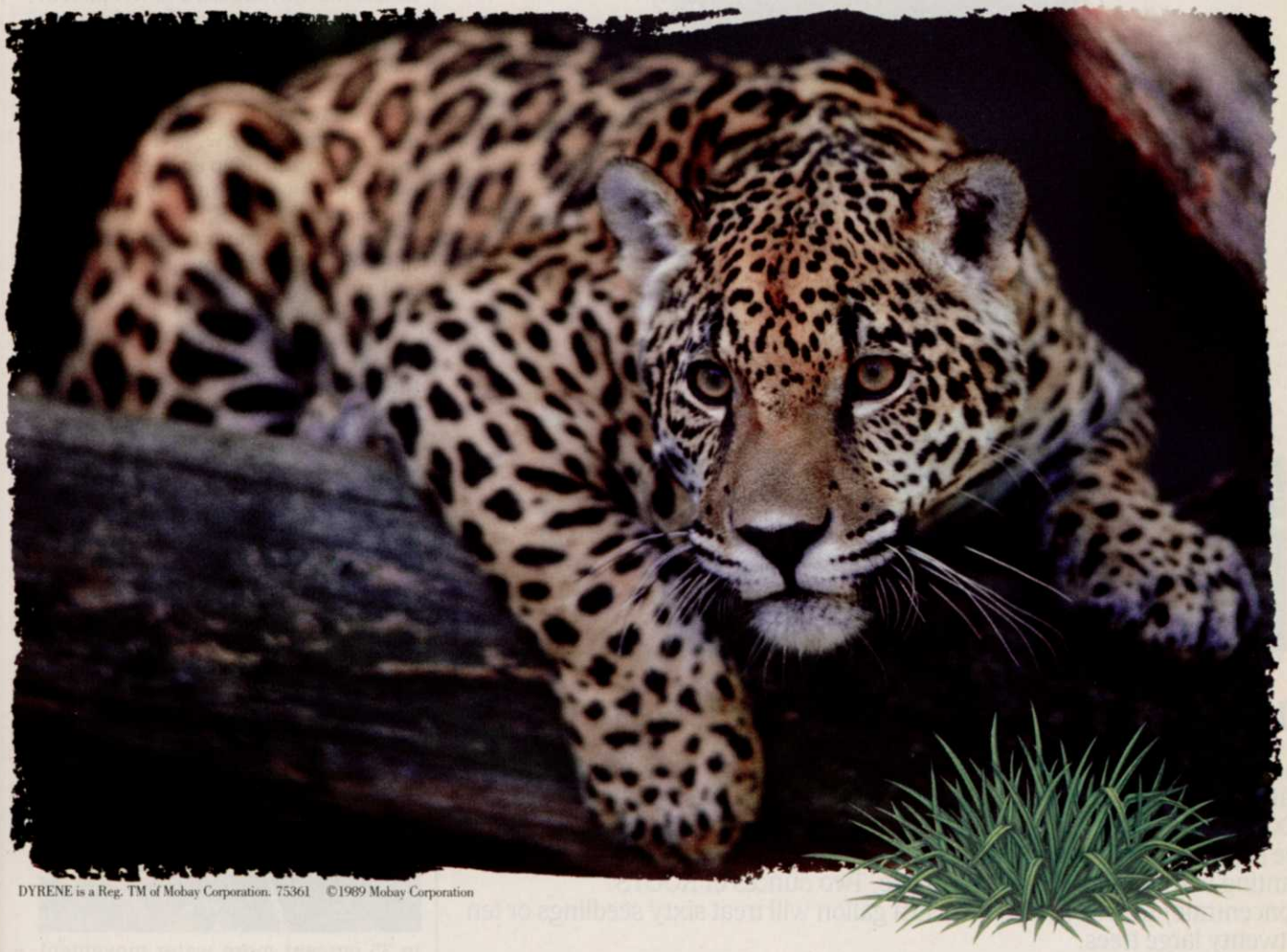
Circle No. 176 on Reader Inquiry Card

# Some Things in Nature Were Meant to Have Spots. Your Turf Just Wasn't One of Them.



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Circle No. 135 on Reader Inquiry Card

Vermeer T594

# PLANTING A TREE IS HALF THE BATTLE . . .

The other half is keeping it alive. Use ROOTS*, the root growth enhancer, to make your installed trees and shrubs thrive. Landscape contractors use ROOTS for fast root regrowth that reduces transplant shock and helps the tree support its above above-ground biomass. Just drench the soil after planting with ROOTS diluted 50 to one. Two ounces of ROOTS (concentrate) to one inch caliper, so a gallon will treat sixty seedlings or ten to twenty large trees.

**REDUCE LOSS IN SOD INSTALLATIONS**

No matter how careful you are when you install sod, stress from drought, heat, poor soil, etc., threaten the life of the turf. New turf needs fast root regrowth to survive. Use two gallons of ROOTS per acre (6oz/1000 sq. ft.), diluted 50 to one with water. Spray the ground before laying sod, or spray the sod after installation.

**KEEP EVERYTHING LOOKING GOOD WITH ironROOTS***

If you are not getting the growth, healthy appearance, or flowering that you want in your plantings, you need ironROOTS, ROOTS root growth enhancer plus 3% chelated iron citrate. Use ironROOTS on your turf and plantings once in the spring, once in the fall. Apply like ROOTS.

ROOTS was developed by scientists at the Yale School of Forestry and is widely used for seeding, overseeding, reseeding, hydroseeding, installation, transplanting, and the maintenance of all stressed turf, trees, and plants. Send in for simple explanation of how ROOTS works, and a list of distributors.

*ROOTS and ironROOTS are trademarks of Soilizer Corporation.

roots inc.
25 Science Park, New Haven, CT 06511

Circle No. 161 on Reader Inquiry Card

**PRODUCTS** *from page 108*

## Drainage system safe from aeration tools

Lesco, Inc. introduces a new, efficient and economical subsurface drainage system for golf courses, athletic fields, lawns, gardens, retaining walls and other areas.

The Lesco Turf Strip Drain is installed in narrow, 2-inch wide trenches in soil deep enough so that it will not be touched by aeration equipment.

It intercepts water flowing through the root zone, shallow ground water and surface runoff and directs it to a storm water outlet.

Normally installed in a grid pattern to take advantage of ground slopes, the Lesco Turf Strip Drain provides up

to 35 percent more water movement than perforated pipe.

The Turf Strip Drain is composed of a high-density, polyethylene core covered by a tough, non-woven, polypropylene, needlepunched, geotextile fabric.

It is 1-inch thick, four, six or 12 inches high, and is shipped in 100-foot rolls.

The core forms a multi-channel structure that provides high flow capacity while the cover fabric permits water penetration from all surfaces. It is resistant to fungus growth and inert to common acids found in soil. It can be used with natural or artificial turf.

**Circle No. 204 on Reader Inquiry Card**

## Roll-Around trimmer easy-to-use, efficient

Snapper Power Equipment has introduced the Roll-Around Trimmer, an easy-to-use "wheel" trimmer. The 21cc trimmer is easy to start with its

# Recognize America's Living Landmarks

From the towering 275-foot Giant Sequoia in California's Sequoia National Park to the relatively diminutive 20-foot Allegheny Plum in Virginia's Blue Ridge Mountains, America's living landmarks are an invaluable part of our nation's natural heritage.

That's why the American Forestry Association began The National Register of Big Trees in 1940. Today, as then, we encourage citizens across the country to find and recognize the largest tree of each species. With your help and participation, we can locate and protect these champions for future generations while fostering a deeper appreciation for trees and forests everywhere.

For information on how to measure and nominate a Big Tree, write: The National Register of Big Trees, American Forestry Association, P.O. Box 2000, Dept. BT, Washington, DC 20013.

THE NATIONAL REGISTER OF BIG TREES

***America's Living Landmarks. Their preservation is every American's concern.***

primer assist mechanism and conveniently located gas tank.

Its two-wheeled chassis is built to carry its own weight, which means less strain on the operator's arms and back. The trimmer's pivoting, adjustable handles, which neatly fold up for easy storage and transport, allow for smooth and precise maneuverability.

Standard features include centrifugal clutch, straight shaft gear head, large fuel tank and a 16-inch cutting swath. The trimmer is designed to use monofilament line.

A throttle guard prevents operation if the trimmer is tilted onto handle bars.

**Circle No. 205 on Reader Inquiry Card**

## New software program to calculate quickly

The calculations required in subsurface drainage system designs require just minutes with Warren's new Waterworks software.

According to Warren's, calculations using varying rainfall amounts and durations, soil permeabilities, drainage field configurations, barrier layer depths and time-till-playable requirements can be completed in about 15 minutes.

The program uses the latest data in subsurface water movement technology needed to design effective, site-specific drainage systems for large or small turf areas. Designers can match drainage system water removal rates to the specific time requirements for turf area 'playability' after rainfall or irrigation.

The software runs on any MS.DOS-compatible personal computer with graphics capability.

**Circle No. 206 on Reader Inquiry Card**

## New trimmer cuts the big projects down to size

RedMax has added the BC440DWM trimmer/brushcutter to its line of rugged, heavy-duty trimming units.

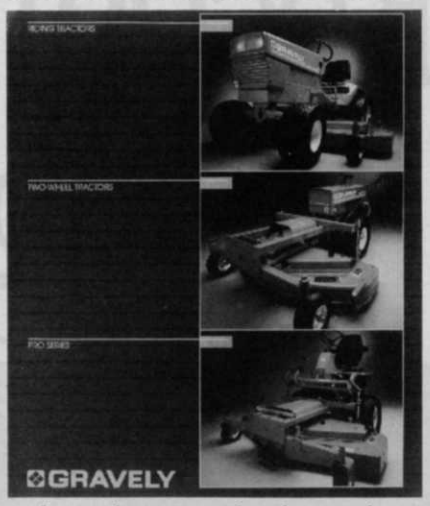
Designed for the most demanding cutting projects, the trimmer features a powerful 41.5cc engine, 1.48-pint fuel tank, dual-line super autofeed head, debris guard and shoulder strap. The unit weighs 18.2 lbs.

Optional accessories include a 10-inch metal blade, 10-inch circular saw, 9-inch mower and a steel debris guard.

**Circle No. 207 on Reader Inquiry Card**

## Time to read up on the latest tractors

Gravely's 1990 catalog of outdoor power equipment is available. It features the entire line of two-wheel tractors, riding lawn and garden tractors and the Pro and Pro Master series of commercial front-mount mowers and attachments. Also featured are new Gravely commercial products such as the Pro Master 20-H hydrostatic front-mount mower and Gravely's first diesel unit, the Pro Master 30-H hydrostatic front-mount mower.




**Circle No. 208 on Reader Inquiry Card**

## Turf care vehicles explored in depth

Cushman has published its newest catalog of turf care vehicles and accessories.

The catalog covers the complete line of Turf-Truckster vehicles, both 3-wheel and 4-wheel units, with engine choices including 22-hp air-cooled gasoline, 27-hp liquid-cooled gasoline, and 22-hp 3 cylinder liquid-cooled diesel. Also included is the Cushman Runabout vehicle, with 22-hp air-cooled gasoline engine and a rated capacity of one ton.

Also listed is the full line of accessories and attachments for Turf-Truckster vehicles, including the Core Harvester, dump boxes, seed and fertilizer spreader and four sprayer models.

Optional features described include a live hydraulics package and 540 rpm PTO drive kit, as well as the exclusive Cushman pin-disconnect system that enables the user to field a virtual fleet of turf maintenance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Circle No. 169 on Reader Inquiry Card

equipment with a single Turf-Truckster vehicle.

**Circle No. 209 on Reader Inquiry Card**

## Chipper/shredder models with many features

Six new chipper/shredder models are available from Crary Company. The 3-, 5-, and 8-hp models all feature unique, free-swinging shredding blades that are serrated self-sharpening, reversible with two cutting edges.

Crary says the shredders will make quick work of twigs, cornstalks, leaves, paper, plastic bottles and more with their unique serrated shredder blades. The 5- and 8-hp models will easily handle logs up to three inches in diameter with their two chipping blades.

Other features include stable 4-point stance, large hopper, various grate sizes, easy to use clutch, and a convenient handle for transporting on smooth or rough terrain.

**Circle No. 210 on Reader Inquiry Card**

## Trimmer/brushcutter co. adds many improvements

Shindaiwa has introduced the T-27 trimmer/brushcutter as a follow-up to model T-25.

A 27.2 cc engine delivers 1.5-hp of high-torque power at 8,000 rpm. The T-27 weighs 12.3 lbs. A 60-inch shaft lets the user stand upright during operation.

Standard equipment includes electronic ignition, TK diaphragm carburetor, approved spark arrestor, muffler with replaceable screen, a full anti-vibration system that encompasses engine, grip and handle, automatic centrifugal clutch and a fully automatic trimmer head.

Other features include high-capacity flywheel fins for efficient forced-air cooling; easy-access kill switch; automatically adjusting fuel tank breather to prevent vapor lock; externally mounted lightweight polyethylene fuel tank; and an air filter silencer that makes for quieter operation.

**Circle No. 211 on Reader Inquiry Card**

## Chipper called fastest disc-design around

The Promark Model 395 Brush Chipper features a chipping capacity of up to 9½ inches. At 175 rfm, it is the fastest disc design chipper in the industry. The 395 also features several new safety and time-saving mainte-

# MORE EFFECTIVE

## Get effective weed control using less spray.

It only takes a few drops of a specially formulated, premixed Expedite® herbicide to do the job. You don't have to spray to wet. Expedite provides uniform distribution of spray droplets and proven weed control with just one pass. Make a change for the better. Contact your local Greens Center or call toll-free: **1-800-323-1421.**

Circle No. 143 on Reader Inquiry Card

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EXP-0-100R (I)

nance features. Gas and diesel engine options are available. The Promark 395 is ideal for use by tree service companies, landscapers, municipalities and other commercial applications.

**Circle No. 212 on Reader Inquiry Card**

## Hybrid controllers precise, advanced, easy to program

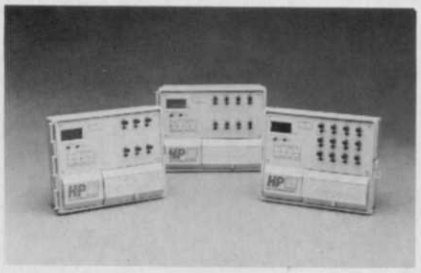
Rain Bird's new HP Series of high-performance hybrid controllers combines the ease of electromechanical programming and the precision of solid-state design with advanced water management capabilities.

The HP Series features individual station timing knobs that offer the user simple, easy-to-understand programming.

Dual programming with independent program shut-off and independent water budgeting from zero to 200 percent permit precise control of irrigation schedules for efficient water use.

A rechargeable battery circuit keeps a nicad battery fully charged to maintain time, program and an active display for as long as two weeks in the event of a power outage.

Even in a prolonged outage, the HP's permanent program memory retains station run times, program assignments and rain shut-down instructions. Protection from electrical shorts is provided by a diagnostic automatic circuit breaker.



The HP Series controllers offer station timing of two minutes to two hours and eight automatic starts per program. They also provide a choice of two-, three-, and five-day fixed-cycle watering schedules or a seven-day variable cycle.

**Circle No. 213 on Reader Inquiry Card**

## New product designs are worth exploring

Exmark Manufacturing Company's 1989 Extravaganza gave Exmark dealers and distributors the opportunity to learn how to help their customers benefit from new product designs.

"The Extravaganza gives us the chance to help educate and train our dealers and distributors so they can better serve customers and be more responsive to their needs," says Roger Smith, sales representative.

Exmark believes the Extravaganza allows dealers and distributors to see the company's complete product line first-hand and to learn about each product by examining and testing the different machines.

Foremost among Exmark's innovative new line are the Exmark Explorer 1800, Turf Ranger 1800 and Turf Tracer 1800.

Exmark plans additional demonstrations for other regions of the nation later this year.

**Circle No. 214 on Reader Inquiry Card**

## Dry flowable marker packet reduces applicator contact

Becker-Underwood, Inc. has introduced Turf Mark WSP, a dry flowable formulation of the company's spray pattern indicator in a convenient, water soluble package.

"We've added new convenience to our products," says Dan Burgeson, Turf Products Manager for Becker-Underwood. "And we've made Turf Mark the most convenient colorant available."

Turf Mark WSP is a dry flowable formulation packaged in a water soluble pack. Both the pack and the WSP colorant dissolve quickly and completely in tank mixed solutions of pesticides and fertilizers creating a highly visible blue color.

The blue color shows applicators where solutions have been applied, helping to prevent skips and overlaps, and to help pinpoint and minimize drift. Turf Mark WSP will not affect chemical efficacy.

Becker-Underwood says Turf Mark WSP virtually eliminates applicator contact, container disposal and mixing/handling problems. Turf Mark WSP comes in a pre-measured packet to treat 100 gallons of spray mixture.

**Circle No. 215 on Reader Inquiry Card**

## Disease guide for turf and ornamentals ready

Proven techniques and products for growing and maintaining healthier, more beautiful turf and ornamental plants are detailed in a new, free publication from Fermenta ASC Corporation.

Each of the first three sections in the 32-page Weed and Disease Control Guide for Turf and Ornamentals provides a chart of proven strategies for preventing or controlling the principal diseases of turf, ornamental plants and conifers in regions across the U.S.

Each section features descriptions of individual diseases that include a detailed list of symptoms, conditions favoring development, susceptible plant varieties and photographs of diseases.

The guide describes the use of pre-emergence and post-emergence herbicides to contol weeds in newly seeded or established turf areas.

Specific information describing spray preparation, application times and rates is supplemented by numerous photographs. The guide concludes with a quick-reference listing of U.S. weights and measures and their metric equivalents to enable easier and more accurate fungicide preparation and application.

**Circle No. 216 on Reader Inquiry Card**

## Turf-type tall fescue, perennial rye available

Titan turf-type tall fescue and SR 4000 perennial ryegrass are now available from Seed Research of Oregon, Inc., the company announced.

Titan is a leafy, turf type with a broad genetic base.

Characteristics include good summer stress tolerance, disease resistance, persistence and high seed yields. Titan has endophyte levels over 90 percent, which ensures endophyte-enhanced performance, including resistance to many common turfgrass insects and nematodes, better summer survival, rapid recovery, reduced weed invasion and increased density.

SR 4000 is an attractive, leafy, persistent perennial ryegrass with a bright, dark green color. Seed Research reports SR 4000 has ranked consistently as one of the top ryegrasses in the National Perennial Ryegrass Trials.

In addition to its excellent resistance to many common turf diseases, SR 4000 has high levels of viable endophyte. This ensures endophyte enhanced performance, which includes resistance to many common turfgrass insects and nematodes, improved drought and heat tolerance, better fall recovery and reduced weed invasion.

**Circle No. 217 on Reader Inquiry Card**

## Turf brush designed for better top dressing

With its Sweep Master turf brush, Gandy Company introduces a newly designed tool for improved top dressing incorporation and more effective surface maintenance.

Designed for golf course and athletic field use, the unit measures 40″ x 78″ and features eight individual brushes set in a double diamond pattern. The upper framework is sturdy 11-gauge steel with 3/8-inch angle crossmembers. Gandy says the unit is able to flex with the contour of the ground.

The Sweep Master has been designed to give improved blending of soil amendments and reduce chatter or jumping during its sweeping action, leaving a clean appearance on geens, tees, clay tennis courts, sand areas and athletic courts.

The basic brush unit may be ordered with optional category I or II three-point hitches or trailer wheels. The trailer version has wheels which flip up to rest on upper framework and make it handy to move during storage.

The unit weighs from 151 to 180 lbs., depending on options.

In any configuration,the Sweep Master may be assembled to pull from either side to equalize brush wear. The synthetic mildew-resistant brushes are individually replaceable.

**Circle No. 218 on Reader Inquiry Card**

## Fertilizer tablets contain complete micronutrients

Remke Enterprises has introduced a line of two-year fertilizer tablets for the fertilization of landscape installations, field liners and maintenance of established plantings.

The safe, easy-to-use, premeasured tablets are available in a 16 gram 14-3-3 analysis and a 21 gram 20-10-5 analysis. Both tablets contain complete micronutrients. Free catalogs and samples are available upon request.

**Circle No. 219 on Reader Card**

## Spray tank cleaner works on residues

A new spray tank cleaner that removes pesticide, adjuvant and additive residues from spray tanks has been developed by Precision Laboratories.

Incide-Out is extremely concentrated and neutralizes residues of pesticides. Precision reports it is compatible with all spray tank components and contains corrosion inhibitors to enhance spray tank maintenance.

Incide-Out can be used with hard water, which commonly causes buildup of scum and mineral deposits. Incide-Out will counteract the mineral buildup and rinse the deposits from the tank, according to Precision.

*continued on page 116*

# MORE PRODUCTIVE

**Make better time without having to constantly refill.**

One 1.3-gallon box of Expedite® herbicide can treat the same area covered by a 3-gallon backpack refilled 15 to 25 times! Expedite is also easy to use — yet precisely accurate. So you reduce the chances for mixing errors and waste.

Make a change for the better. Contact your local Greens Center or call toll-free: **1-800-323-1421.**

Circle No. 144 on Reader Inquiry Card

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**PRODUCTS** *from page 115*

Precision reports extensive testing of the new product by agricultural and turf research agencies. The agencies report that Incide-Out effectively penetrates pesticide and additive residues and bonds them into the rinse water to allow for complete rinsing and system purging with ordinary water.

**Circle No. 220 on Reader Inquiry Card**

## Walk-along trencher is fully hydrostatic

A new, fully-hydrostatic walk-along trencher, designed with simple, easy to understand operator controls and built-in protection systems, is available from Vermeer.

The Vermeer V-1550 hydrostatic trencher comes equipped with a solid-state ignition, a heavy-duty solenoid starter, compact wide frame design and an 18 hp Kohler magnum engine. The heavy-duty rock and frost digging boom, with a 7-inch diameter end idler, can be set to dig 4-10 inches wide, down to 48 inches deep.

The 1,480-lb. unit features infinitely variable fluid power to both drive and working attachments with a two-speed gear box that's completely enclosed and lubricated within a large

10-gallon capacity hydraulic oil reservoir.

The 2-speed gear box creates a low-speed range that ensures total operator control in creep.

The larger fluid power capacity also delivers substantially more torque to an optional front-end boring attachment. A mechanical no-spin differential provides extra traction. An optional oil cooler is available for heavier, longer usage and hotter conditions.

**Circle No. 222 on Reader Inquiry Card**

## Lyme disease fighter in different sizes

EcoHealth, Inc., the makers of Damminix for control of Lyme disease carrying ticks, announced that a 96-tube box of Damminix is now available to professional applicators under the name of "Damminix—For Professional Use."

This product line will be sold at reduced rates to public agencies and non-profit community groups who use Damminix to protect public access areas.

"Professional pesticide applicators and public agencies asked us to develop a package just for them," says Alexander Kovel, president of EcoHealth. "We responded by packaging Damminix in a larger box and by introducing special pricing for public agencies and non-profit groups treating public land."

EcoHealth says the price for public agencies has been reduced by one-third from 1989 prices for an equivalent amount of product, reflecting production cost savings and a company commitment to make an important public health protection product available for public open space.

**Circle No. 223 on Reader Inquiry Card**

# MORE PROTECTION

## Closed system offers better worker protection.

Expedite® herbicides are premeasured and premixed. So you don't come in direct contact with them. You simply connect the Expedite lance hose to a sealed 1.3-gallon box of herbicide. Then set the lance and you're ready to spray. Make a change for the better. Contact your local Greens Center or call toll-free: **1-800-323-1421.**

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# CLASSIFIEDS

**RATES:** $1.20 per word (minimum charge, $35). Bold face words or words in all capital letters charged at $1.45 per word. Boxed or display ads: $100 per column inch-1x (one inch minimum); $95-3x; $90-6x; $85-9x; $80-12x. (Frequencies based on a calendar year). Agency commissions will be given only when camera-ready art is provided by agency. For ads using blind box number, add $15 to total cost of ad. Send ad copy with payment to Dawn Nilsen, LANDSCAPE MANAGEMENT, 1 East First Street, Duluth, MN 55802 or call 218-723-9505. Fax Number 218-723-9615.

**BOX NUMBER REPLIES:** Mail box number replies to: LANDSCAPE MANAGEMENT, Classified Ad Department, 1 East First St., Duluth, MN 55802. Please include box number in address.

## BUSINESS OPPORTUNITIES

**CURBMATE - THE MONEY MACHINE:** Patented, electrically driven and self-propelled machine produces beautiful continuous concrete landscape edging. Simplifies the installation of concrete borders between lawns and flower beds, along driveways and sidewalks, etc. Applications for residential and commercial settings, golf courses, etc. Turn $5,000-$10,000 equipment purchase into $50,000-$100,000 potential annual income. (801)273-3938. 3/90

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**LANDSCAPE CONTRACTING BUSINESS:** Established 1959, $500,000 gross annual sales; $120,000 inventory. Rural Home/Business close to city limits with tremendous growth potential. Owner retiring. For more information reply to: Landscape Contracting, PO Box 16954, Hattiesburg, MS 39402. 3/90

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**LEARN** Professional Landscaping and Gardening at home. Accredited program provides thorough training in all phases of commercial and residential landscaping. Certificate awarded. Free booklet describes program and opportunities in detail. Lifetime Career Schools, Dept. A-415, 2251 Barry Ave., Los Angeles, CA 90064. 9/90

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**CONNECTICUT AND NORTHEAST:** Selling or buying a green industry business? I'm a specialist in your field with over ten years experience and can locate buyers and sellers. Phil Nilsson (203)621-6199. 7/90

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**WANT TO BUY OR SELL A GOLF COURSE?** Exclusively golf course transactions and appraisals. Ask for our catalog. McKay Golf and Country Club Properties, 15485 N. East Street, Lansing, Michigan 48906. Phone (517)484-7726. TF

## HELP WANTED

**PROJECT MANAGER - LANDSCAPE CONSTRUCTION DIVISION:** We are seeking applications for a Top Notch Project Manager with the ability to estimate, coordinate and manage multiple projects simultaneously. You will be responsible for communicating with major clients, management and field supervisors. Administrative skills with attention to follow-up and detail is necessary. If you are the type of individual that thrives on responsibility and can operate with little direction, we would like to hear from you. Please submit a resume with a cover letter and salary history to: **GOODE AND COMPANY, PERSONNEL DIRECTOR, 860 WEST LONG LAKE, BLOOMFIELD HILLS, MI 48013.** 3/90

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Irrigation Professionals Needed - Aggressive, fast growing irrigation company is seeking Installation Foreman, Service Technician, and Installers. Excellent wage and benefit package. Send resume to P.O. Box 25125, Lansing, MI 48909. 3/90

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***REINHOLD & VIDOSH, INC.*** represent 100 years of landscape experience and rank as one of the nation's largest full service landscape companies.

If you are a landscape professional seeking a career opportunity and would like to become an integral part of an aggressive, innovative national landscape company, send us your resume.

***REINHOLD & VIDOSH, INC.*** has offices in Michigan, Tennessee and Florida and projects throughout the midwest and southeast. Our growth and corporate diversification has created several outstanding career opportunities in the area of landscape and golf course construction, landscape maintenance and landscape supply. We offer a very competitive package of salary and benefits and we are an equal opportunity employer.

Send your resume in confidence to:

The President
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Pontiac, MI 48058-1923

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**FOREMEN TRAINEES:** Washington, D.C. Area Design-Build Firm is looking for career minded individuals who want to learn top-of-the-line residential landscaping-construction, planting and landscape maintenance. Some experience and/or education in horticulture or landscaping helpful but not necessary. We work a 4-5 day week and offer good pay with benefits. Send resume to: **GARDEN GATE LANDSCAPING,** 821 Norwood Road, Silver Spring, MD 20904. 4/90

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**LANDSCAPE CONSTRUCTION FIRM IS SEEKING: *CONSTRUCTION FOREMAN*** with 3-5 years experience, minimum. Must be well motivated and able to motivate others, direct projects from beginning to end. Blue print reading and plant knowledge a must. Willingness to work hard and produce will lead to advancement. Please submit resume with salary history to: Goode & Company, Personnel Director, 860 West Long Lake, Bloomfield Hills, MI 48013. 3/90

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**TURF CARE DEPT. MANAGER:** Tree and lawn care company in Boulder, Colorado seeking a progressive department manager for complete turf care services, with an emphasis on developing and implementing integrated approaches to turf management. Applicant must: have sound knowledge of turf; deal effectively with the public and clients; possess technical skills and production capabilities. Send resume and relevant work/educational history to: Stefan Ringgenberg, Boulder Tree & Landscape Co., P.O. Box 1396, Boulder, CO 80306 3/90

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Expanding Northeast Ohio Maintenance and Construction Company has openings at the Foreman level. Fulfill your career goals with a 6 million dollar company that is still growing. Send your resume and salary requirements to Mr. Herrmann, P.O. Box 438, Painesville, Ohio 44077-0438. 4/90

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Landscape Supervisor: Established Michigan Contractor looking for self-motivated individual with 5 years minimum experience to manage crews and oversee landscape installation. Send resume and salary requirements to: DeAngelis Landscape Incorporated, 22425 Van Horn Road, Woodhaven, Michigan 48183. EOE. 3/90

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**ESTATE MANAGER:** Experienced person to manage Greenhouse, Formal and Vegetable Gardens. Lawn Care, including Insecticide Control. House, plus utilities available. BC-BS. Salary negotiable. Send resume to Box 4300, Wilmington, DE 19807. 5/90

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**LANDSCAPE MAINTENANCE SUPERVISORS:** Rapidly expanding landscape maintenance firm seeking experienced, quality individuals to be field/working supervisors. Tremendous opportunity to grow. Full benefits. Contact: Tandem Landscape Company, 33W480 Fabyan Parkway, West Chicago, Illinois 60185, Attn: Glenn Kedzie. TF

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Garden Center Manager-Wholesale-Retail Nursery, selling nursery stock and related goods. No growing. Need honest conscientious person with minimum two years experience in wholesale sales in area. Excellent starting salary with incentives. Sherman Valley Nursery, 15 Raccio Park Road, Hamden, Connecticut, 06514, (203)287-0827. 3/90

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We are seeking a mature couple for caretakers of country estate. Must have knowledge in lawn, shrub, tree and pond maintenance with experience in herbicide/pesticide application. Need good mechanical aptitude for outdoor equipment and indoor systems. Must be self-motivated with strong work ethic and have a sense of personal pride in job. Housekeeping and babysitting skills necessary for your spouse. House on grounds provided. Both salaries commensurate with experience. Send resume with a cover letter and salary history to: Susan Hansford, Hansford Mfg., 3111 Winton Rd. S., Rochester, NY 14623. 3/90

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**KT ENTERPRISES, INC.,** a commercial landscape management firm servicing the Washington, DC Metropolitan market, is now accepting applications for employment in their landscape maintenance department for the 1990 season and beyond. All positions offer excellent salary, health benefits, retirement and, most importantly, an incomparable opportunity to work in a quality organization that will continue to offer professional satisfaction. Please send resume to: Mr. Doug Sevachko, KT Enterprises, Inc., 4001 Westfax Drive, Chantilly, VA 22021 if you're interested in any of the following positions: Pruning Department Supervisor, Maintenance Department Supervisor, Maintenance Department Manager, Pruning Department Manager, Floral Installation Manager, Turf and Ornamental Plant Specialist. 4/90

Major award winning midwest landscape firm seeking a qualified, experienced individual to negotiate and sell commercial landscape maintenance. Some design experience would be helpful, but most of all this individual must understand the business side of commercial landscape maintenance from initial contact through execution of the work. If you are aggressive, self motivated and are willing to work hard for success, send a complete resume along with past work history and salary requirements to: Arnold O. Sieg, The Bruce Company, 4950 Memco Lane, Racine, WI 53404. 3/90

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**DESIGN ASSOCIATES, GOLF DRAFTSMEN, JOB SITE COORDINATORS, GOLF COURSE SHAPERS:** Leading major golf design firm has openings for very experienced, talented and aggressive persons. AS or BS in Landscape Architecture, Agronomy, Turf Management or related field required, except for shapers. International and Domestic positions available. Excellent compensation and benefit packages. Send a confidential resume with experience and salary history to Marilyn Hannan, Personnel Development Assistant, Jack Nicklaus Golf Services, 11780 U.S. Highway #1, North Palm Beach, Florida 33408. 4/90

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**BRANCH/SALES MANAGERS; JUNIOR AND SENIOR LEVEL.** Orkin Lawn Care offers more to our Managers, so why settle for less? Our company is a leader in its field and expansion dictates the need for senior level Branch and Sales Managers to maintain our high-standards and the integrity that has built the Orkin reputation. We offer unlimited room for advancement into top-level management, salary plus incentive bonus, and a comprehensive benefits package to talented, ambitious Orkin team members who are dedicated to success. You will report directly to Zone Managers and be required to: *Initiate and develop effective work atmosphere, *Meet financial objectives — revenue, cost control, profits and profit margins. *Enforce Orkin policies and procedures *Maintain a strong customer base *Select and train new employees. If you can fulfill these objectives and have the aptitude to prioritize duties and projects, send a confidential resume to: **ORKIN LAWN CARE, PAT GUY,** 2170 Piedmont Road, Northeast, Atlanta, GA 30324. 3/90

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**LANDSCAPE DESIGN/SALES:** Leading Kansas City Landscape Company has immediate openings for talented, experienced, and aggressive persons in residential/light commercial design and sales. A.S. or B.S. in Horticulture or related fields preferred. Competitive compensation and benefits package. Send a resume with experience and salary history to the address listed below: **HERMES COMPANY, INC.,** P.O. Box 14336, Lenexa, KS 66215. (913)888-2414. 3/90

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**TURFGRASS SUPERINTENDENT/TURF NURSERY SUPERVISOR:** Progressive family owned sod farm is seeking an individual with turfgrass and/or farming background. Turf experience and degree is preferred, but not required. Responsibilities include managing all phases of Kentucky Bluegrass development from seeding to mature sod. Applicant must provide leadership, like outdoor work and enjoy laxed off season. Salary commensurate with qualifications. Health benefits, retirement plan and profit-sharing available. Send resume to DeBuck's Sod Farms, 142 Mission Land Road, Pine Island, New York 10969. 3/90

**SHAPING MAN.** Golf course construction company desires small dozer operator to shape golf course features. Compensation based on experience and ability. Midwest Golf Development, Inc., 800 McHenry Avenue, Suite H, Crystal Lake, IL (815)459-6565. 3/90

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"Consider all of your employment options in the irrigation and landscape industries. Call **Florapersonnel,** the international employee search firm for the ornamental horticulture industry. Completely confidential. Employer pays fee. **Florapersonnel,Inc.,** P.O. Box 1732, 1450 S. Woodland Blvd., Suite 201, DeLand, FL 32721-1732. (904)738-5151. Jim Bambrick, Jeff Brower, David Shaw, CPC, Bob Zahra, CPC." TF

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**OPPORTUNITY FOR CAREER-MINDED PROFESSIONALS.** The Northwest's most progressive commercial landscape firm is seeking team-oriented persons capable of effective managing, supervising. Construction Supervisor- minimum 5 years experience and ability to oversee three to six crews. Maintenance Area Supervisor- combination of two year horticulture degree and two year managerial experience in landscape minimum. Foremen (M/F) Construction, Maintenance- minimum three years experience and ability to supervise crews of 3 to 6. Challenging positions waiting for people able to take charge and be the best. Excellent salary, benefits. Send resume in confidence to LM Box 476. 3/90

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**A LANDSCAPE AND DESIGN FIRM:** We are an aggressive contracting firm seeking highly qualified individuals. Positions available: Landscape Design and Sales, Field Managers. Benefits and opportunity for advancement. Send resume to: Naturescape of Solon, Inc., 7224 Liberty Road, Solon, Ohio 44139. 3/90

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**GROUNDS MAINTENANCE/LANDSCAPE/LAWN CARE-** Expanding grounds management firm in Cincinnati seeks qualified and experienced personnel to fill openings in Grounds Maintenance, Landscape Construction, Lawn Care, Irrigation and Flower Care. Quality conscious individuals knowledgeable in ornamentals, turfgrass, landscape installation, grounds maintenance, irrigation, pest management and flower care should respond. Outstanding compensation, benefits and advancement opportunities available. Letter or resume to **PROLAWN PROSCAPE,** 11488 Deerfield Road, Cincinnati, Ohio, 45242; Attn: Clayton Sheeler. (513)489-2433, days. 3/90

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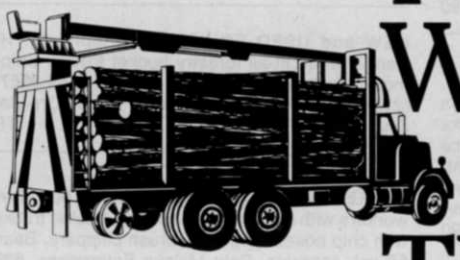

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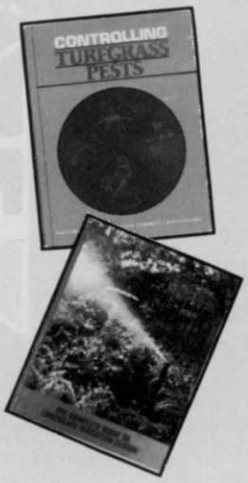

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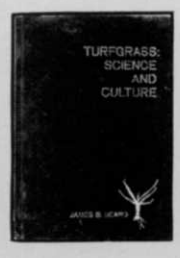

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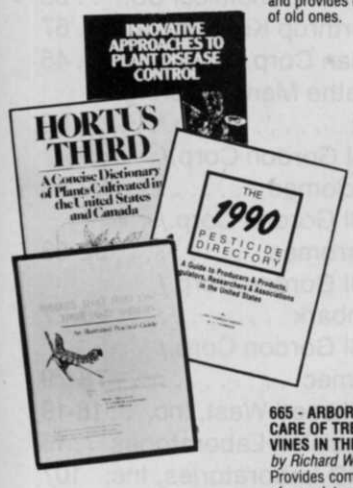
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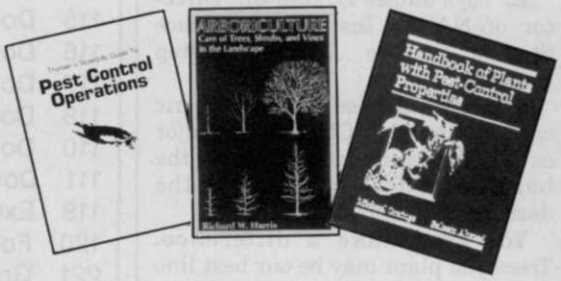
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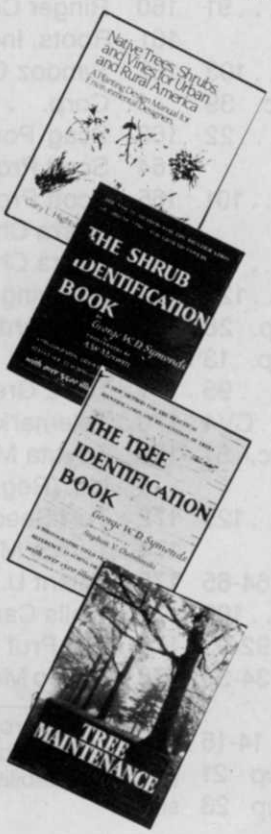
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**The National Arbor Day Foundation Urges You to Plant Trees to Fight the Greenhouse Effect**

The Earth is heating up. "The Greenhouse Effect," says James E. Hansen, Director of NASA's Institute for Space Studies, "is here...it's time to stop waffling."

A sharp increase in atmospheric carbon dioxide ($CO_2$) is a major cause. Two things contribute — the burning of fossil fuels and the destruction of forests.

**You can make a difference.** Trees you plant may be our best line of defense.

**Free Booklet.** The National Arbor Day Foundation has published a guidebook titled *Conservation Trees*. I'll send your free booklet by return mail.

John Rosenow

John Rosenow, Executive Director
National Arbor Day Foundation

**Yes,** I want to help fight the Greenhouse Effect. Send my free *Conservation Trees* booklet.

Name

Address

City

State, Zip

Mail to: Conservation Trees, National Arbor Day Foundation, Nebraska City, NE 68410


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Circle No. 275 on Reader Inquiry Card

# PROBLEM MANAGEMENT

by **Balakrishna Rao,** Ph.D.

## Can courses afford a day off?

**Problem:** *Has any study been made of the extra expense that we probably absorb by keeping our golf courses in use seven days a week instead of six? (New Jersey)*

**Solution:** I am not familiar with any studies dealing with golf course maintenance expenses. I was also unable to obtain any pertinent data for your question from the National Golf Foundation (NGF), Golf Course Superintendents Association of America, or USGA Greens Section.

A representative of the NGF said, "They prefer six days of play instead of seven because of concentrated maintenance schedule and then having a day of rest. If the golf course is shut off a day, the turfgrass quality will be improved. The players are likely to pay higher greens fees. Some people may prefer to keep the courses open seven days per week. In this situation it is difficult to maintain the quality. Many of the public courses are under this pressure without choice. They keep the courses open seven days a week."

From this discussion it appears that from an agronomic standpoint, it is better to have at least a one-day rest period to produce a quality play area. The anticipated extra revenue from one extra day of play may break even with the expenses for maintenance and wear-and-tear on the course. My general feeling is that it is best to keep the course open for six days instead of seven.

We will keep you updated if any of our readers respond with statistical data.

## Replenishing 'other' nutrients

**Problem:** *A lot of research has been done on nitrogen fertilization of cool-season turfgrass, particularly amount and timing of nitrogen. But what about phosphorus and potash and the micronutrients? After testing for these nutrients, do we correct the soil pH? Should we deep-place the nutrients after aerifying? Or do we topdress with a commercial fertilizer blend that comes close to the recommendation? (Minnesota)*

**Solution:** If the nutrient analysis indicates that there is a deficiency of phosphorus, potassium and micronutrients, then they should be applied to correct the problem. Most people use fertilizer with nitrogen, phosphorus and potassium at a 4:1 or 4:1:2 ratio. Macronutrient deficiencies are most commonly found in the Pacific Northwest or the Gulf States and are rarely found in other areas.

As far as the second question, the answer is yes; pH correction is needed after testing for these nutrients. Having the pH in the proper range (pH 6.0 to 7.0) will maximize the availability of nutrients.

In many situations, correcting the pH alone may not be sufficient to remedy the problem. A supplemental fertilizer application would be beneficial. Applications at the recommended rate can be made after aerifying for deeper placement or can be broadcast on the surface.

Remember that a surface application of phosphorus is not beneficial because it doesn't move readily. Therefore, deeper placement of phosphorus would be beneficial to turfgrass. Topdressing fertilizer would be all right except for phosphorus for the above-mentioned areas.

## Adding iron to fertilizer

**Problem:** *What iron can I add to my granular fertilizer to avoid staining concrete surfaces? (New Jersey)*

**Solution:** From your question, I understand that you are interested in adding a granular formulation of iron to granular fertilizers. I am not familiar with any granular formulations of iron currently available. Lesco Inc. is currently working on a dry granular formulation of iron which they hope to market by late 1990 or 1991.

As you may be aware, there are a number of granular fertilizers that contain iron. You could consider using them if they meet your need.

All of the iron-containing products on the market now or the one Lesco is going to produce will have the staining problem on porous surfaces such as concrete. Although this is difficult and time-consuming, these stains can be removed by cleaning with materials such as muriatic acid, citric acid or sulfuric acid. Reports indicate that you have to be very careful in handling or using these. If these products come in contact with turfgrass they can be phytotoxic. A representative from Lesco indicated that they will have a product called "stain eraser," a stain-removing compound, by spring. **LM**

**Balakrishna Rao is Manager of Technical Resources for the Davey Tree Co., Kent, Ohio.**

Questions should be mailed to Problem Management, LANDSCAPE MANAGEMENT, 7500 Old Oak Boulevard, Cleveland, OH 44130. Please allow 2-3 months for an answer to appear in the magazine.

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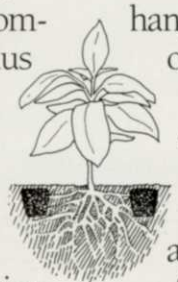

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